R E P O R T R E S U M E S

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PERSONALITY CHARACTERISTICS OF SCHOOL SUPERINTENDENTS IN RELATION TO THEIR WILLINGNESS TO ACCEPT INNOVATION IN EDUCATION.

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REPORT NUMBER BR-6-8273 PUB DATE JUL 67
GRANT OEG-3-6-068273-1387
EDRS PRICE MF-$0.50 HC-$3.60 88P.

DESCRIPTORS- *SCHOOL SUPERINTENDENTS, *PERSONALITY ASSESSMENT, EDUCATIONAL CHANGE, *EDUCATIONAL INNOVATION, EDUCATIONAL PRACTICE, *SUPERINTENDENT ROLE, *ADMINISTRATOR ATTITUDES, HYPOTHESIS TESTING, STATISTICAL ANALYSIS, EDUCATIONAL RESEARCH, BIBLIOGRAPHIES, CHANGE AGENTS, LOGAN, CATTELL 16 PF TEST,

TO DETERMINE WHETHER A CORRELATION EXISTS BETWEEN PERSONALITY CHARACTERISTICS OF SCHOOL SUPERINTENDENTS AND THEIR WILLINGNESS TO IMPLEMENT INNOVATIONS IN EDUCATION, CATTELL'S 16 P.F. QUESTIONNAIRE AND A THREE-PART SCALE ON INNOVATION WERE EMPLOYED TO GATHER DATA FROM 93 IDAHO SUPERINTENDENTS AND 71 SUPERINTENDENTS FROM 12 OTHER STATES WHO HAD BEEN IDENTIFIED AS INNOVATORS. BOTH THE COMPOSITE INNOVATION SCORE AND THE EDUCATIONAL PRACTICE SCORE WERE FOUND TO BE SIGNIFICANTLY RELATED TO THE 16 PERSONALITY FACTORS. HIGH AND LOW INNOVATIVE SUPERINTENDENTS WERE FOUND TO DIFFER SIGNIFICANTLY ON SIX PERSONALITY FACTORS. THE STUDY CONCLUDED THAT (1) THERE IS A SIGNIFICANT CORRELATION BETWEEN PERSONALITY CHARACTERISTICS OF SUPERINTENDENTS AND THEIR WILLINGNESS TO ACCEPT AND IMPLEMENT CHANGE IN EDUCATION, AND (2) THERE IS A SIGNIFICANT DIFFERENCE BETWEEN THE PERSONALITY CHARACTERISTICS OF THE HIGH AND THE LOW INNOVATIVE SUPERINTENDENTS. HIGH INNOVATIVE SUPERINTENDENTS ARE MORE OUTGOING, ASSERTIVE, VENTURESOME, IMAGINATIVE, EXPERIMENTING, AND RELAXED THAN LOW INNOVATIVE SUPERINTENDENTS. (JK)

ED015528

FINAL REPORT

PROJECT NO. 6-8273

GRANT NO. O.E.G. 3-6--68273-1387

Personality Characteristics of School Superintendents In Relation To Their Willingness To Accept Innovation in Education

July, 1967

U. S. Department of Health, Education, and Welfare
Office of Education
Bureau of Research

EA 000 917

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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By
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and
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July, 1967

The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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ACKNOWLEDGMENTS

The author, Homer M. Johnson, wishes to acknowledge the work of George M. Carnie who initiated the idea of the project, prepared the innovation scale and assisted in gathering data on the Idaho superintendents. Clifford J. Lawrence added to the review of literature and collected data on the national (S.D.C.) superintendents. Appreciation is also expressed for the treatment of data and suggestions by Dr. Herbert W. Eber at the computer center of the Institute for Personality and Ability Testing in Birmingham, Alabama.

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INTRODUCTION

The purpose of this investigation was to determine whether a relationship exists between personality characteristics of school superintendents and their willingness to accept innovation or new ideas in education.

The American society is experiencing, and will continue to experience, an increasing rate of change. The rate of technological change alone creates almost daily modifications in our way of life and our educational needs. For the most part, however, educational practices have remained almost static. The disparity between instructional developments and their implementation has been a steadily widening one.

Smith (28) noted that the status quo that seems to be maintained in education when extreme changes are evident in every other aspect of our way of life is being questioned. Brembeck (7) shared similar views. The U. S. Office of Education, recognizing this problem, has established nine research and development centers in an attempt to reduce the lag that exists between newly developed educational practices and their acceptance by schools. The American Association of School Administrators (3) has gone on record with a statement indicating that schools cannot achieve the purposes they are expected to achieve without innovation in education.

Melby (24) further indicated that the greatest indictment against present educational administration is its failure to promote creativity, originality, and innovation. According to Campbell (10), superintendents who are tradition-bound and inflexible are obsolete. Arrowsmith (4) pointed out that there is no evidence of real innovation anywhere, and there seems to be a vacuum in administrative leadership directed toward change.

Therefore, strong leadership on the part of school superintendents is essential if resistance to change is to be overcome. Brickell (8) has emphasized this need for strong leadership by indicating that instruction changes ". . . depend almost exclusively on administrative initiative." If this is true, the selection of superintendents who are or who have the potential to be change agents is essential. In order to identify persons who might provide this leadership, it will be necessary to understand why some superintendents will embrace change, why some will simply tolerate it, why others will resist it, and why a few will openly oppose it. A study by Carlson (11) investigated the rate of adoption of new educational practices. His findings indicated that:

> . . . characteristics of the holder of the superintendency which have been ignored in past

> diffusion research in education must be taken into account in efforts aimed at a complete explanation of school systems' rate of adoption of new educational practices.

The position of the superintendent relative to innovation in a school system was also discussed by the Systems Development Corporation Study (26) following their Traveling Seminar and Conference for Implementation of Educational Innovations. They found that the attitude of the local superintendent of schools toward innovation is a significant variable in the introduction of innovations in school districts. The findings of this study indicated that the ambition and leadership skill of a superintendent of schools was related to the innovational behavior of the school district. The implementation of successful innovations in schools tended to be found wherever there was evidence of strong, positive, and dynamic leadership behavior by local superintendents. The data from this project support the contention of Brickell (8) that the superintendent is a key figure in implementing new practices in schools.

Therefore, innovations of major scope, those that require significant changes in content, the use of time, space and facilities, require active support from the superintendent if they are to be successful in the school program. Because the superintendent is so important to innovative measures, he is not only the one to encourage change, but often is the one responsible for preventing innovations. According to Miles (25), such forms of rejection as ignorance and suspended judgment by superintendents are responsible for preventing many innovations.

Research by Erickson (17) and Kemp (22) indicated that change will be extremely difficult for many individuals. In describing the problem of identification of administrators willing to make change, Miles (25) states that:

> It has been asserted that strong, benevolent persons often find themselves in an important and central role in change efforts . . . intelligence and verbal ability seem important. The innovator appears to be less bound by local group norms . . . Intelligence and creativity have been suggested not to be enough, however, to persuade and enlist the help of others and overcome resistance . . . Further attention to the innovative personality is undoubtedly desirable.

It seems, then, that the nature of innovators and adopters as individuals form an area much lacking in theoretical sophistication. On the assumption that an individual's willingness to accept change may be related to his personality characteristics,

investigation of personality characteristics seems one possible avenue of exploration of the impediments of change.

Related Studies

A number of studies during recent years have been completed which attempt to determine whether common personality characteristics can be identified among successful practitioners in various vocational areas. One widely used instrument has been Cattell's 16 P. F. test, which is a personality test based on factor analysis measuring 16 factors on traits of the personality.

Cattell (15) indicates that today recognition is being given to the notion that individual differences can be assessed as readily by personality measures as by measures of ability.

> Personality is that which permits a prediction of what a person will do in a given situation and that small segments of the personality are understood when seen within the framework of the entire organism.

A basic theme, therefore, in terms of personality characteristics of educators seems to be emerging as evidenced by the following studies.

Adams, Blood, and Taylor (1) and Jackson and Guba (21) have indicated that personality traits of teachers differ from other educators; Burdick (9) found a significant correlation (.05 level) between student-teaching success and certain personality characteristics.

Hemphill (19) reported finding significant relationships between personality factors and principals' performance in dealing with simulated administrative problems. White (29) compared the personality characteristics of educational administrators with general population norms and also with educational researchers. Both the administrators and the researchers differed from the general population norms at the .01 level of confidence on 10 of the 16 personality factors. Cattell and Drevdahl (14) made a study of administrators and researchers in physics, biology and psychology. Their findings were consistent with those of White on five factors.

Fogarty (18) used Cattell's 16 P. F. test as part of a study to determine the relationships between personality characteristics and centralization of decision-making by superintendents of schools. The personality factor scale revealed that the 20 superintendents involved in the study were above average on warmth and sociability, general intelligence, sensitivity, absent-mindedness, self-sufficiency, intenseness, and excitability. They were below average on three factors, indicating they were more

emotional, more sober and serious, and more simple and unpretentious than the typical adult male.

Several studies, originating in the Department of Educational Administration at Utah State University, have investigated the identification of personality factors of educators as related to their tendencies toward innovation. Bos (6), in a study of school administrators, teachers and professors of education, attempted to determine if the three groups differed significantly in their role and personality expectations for change agents. He found that educators expected implementors of change to be intelligent, emotionally stable, adaptable, experimenting, and enthusiastic. Hinman (20) investigated the relationship between personality characteristics of principals and their implementation of innovation. She found principals who implement innovations to be more assertive, more happy-go-lucky and venturesome than were non-innovators.

In a study designed to investigate and analyze relationships between superintendents' leadership behavior and personality and the extent of the adoption of new educational practices in the superintendents' district, Bell (5) found differences between the personality characteristics of superintendents and their leadership behavior as measured by Halpin's L.B.D.Q. instrument.

These studies show that personality characteristics of successful practitioners in various vocational areas do vary, and suggest a need for further investigation in order to identify definite personality characteristics shown by educational implementors of change.

Statement of the Problem

We assume, then, that the superintendent must play a key role in meeting the challenge of change. His status within the school system makes him the only person who can marshall the necessary authority and precipitate the decisions necessary for the adoption of instructional innovations. He is the spokesman for education in the community, and his success in dealing with the local power structure determines, to a great extent, the availability of resources for education and the attitude that will prevail.

Furthermore, Richland (26) has written that the implementation of innovation practices within a school system has been shown to relate directly to its superintendent's attitude toward innovation. If it can be assumed that such attitudes are related to personality characteristics and if these characteristics can be identified, the task of identifying educational leaders to meet the challenge of change may be simplified. The problem,

then, is to determine whether or not superintendents who embrace change can be identified by the uniqueness of their personality characteristics.

Hypotheses

Based on the research that Cattell and others have carried out involving personality traits relative to human behavior, it would seem reasonable to hypothesize that there is a relationship between personality characteristics and willingness to accept innovation or change. Therefore, our research tested the following null hypotheses:

1. Personality characteristics of superintendents as measured by the 16 P. F. are not significantly correlated with the superintendents' willingness to accept change as measured by their responses to innovation scales.

2. The 16 P. F. scores of superintendents described as being interested in and implementors of innovation by the Systems Development Corporation Study will not differ significantly from the 16 P. F. scores of Idaho superintendents.

3. The 16 P. F. scores of all superintendents in this study scoring +1 standard deviation or more on composite innovation scores will not differ significantly from the 16 P. F. scores of superintendents in both groups scoring -1 standard deviation or more on composite innovation scores.

4. The age of superintendents is not significantly associated with their willingness to accept change as measured by innovation scales.

5. The mean number of years superintendents remain in a position is not significantly associated with their willingness to accept change as measured by innovation scales.

6. The size of the school district is not significantly associated with the superintendents' willingness to accept change as measured by innovation scales.

METHOD OF THE STUDY

Subjects of the Study

The subjects of the study were taken from two groups of school superintendents: (1) 105 Idaho school superintendents representing school districts with student enrollments in grades 1 through 12 and (2) 103 school superintendents from across the United States with known interest and involvement in educational innovation.

The Idaho superintendents were selected on the assumption that they would be somewhat normally distributed along a continuum from low innovation to high innovation and that they would represent a diversity of individual personality characteristics.

Of the 105 Idaho superintendents asked to participate in the study, 93 agreed to cooperate. The 93 participating Idaho superintendents ranged in age from 27 to 68 with an average age of 44.3 (Table 1). They were the chief administrative officers of school districts ranging in enrollment from 112 to 11,900 students and employing a low of 6 teachers to a high of 815 teachers (Table 2). The superintendents had remained in a position from 1 to 28 years with an average of 4.2 years (Table 3).

The 103 superintendents of school districts with known interest and involvement in educational innovations were chosen as the superintendents of the school districts selected to participate in Systems Development Corporation's 1964-65 study of the value of traveling seminars and conferences in the implementation of educational innovations.

In this study, 300 school districts from across the nation were nominated by leading educational authorities, representatives of state departments of education and teacher training institutions as being interested in and implementors of instructional innovations. From this list the final sample of 103 districts was selected to participate in the study. Seventy-one superintendents of the 103 originally involved in the Systems Development Corporation study agreed to cooperate in this study.

The superintendents from this national group (S.D.C.) were employed in the states of Ohio, Florida, Arizona, California, Michigan, Massachusetts, Illinois, New York, Missouri, Maryland, Pennsylvania, and Georgia. They ranged in age from 36 to 64 with an average age of 52.1 (Table 1). Their districts ranged by enrollment from 320 students to 91,000 students; and by staff size from 20 to 4,000 (Table 2). They had remained in their positions an average of 7.9 years with a range of from 1 to 28 years (Table 3).

Table 1. Frequency Distribution of Superintendents by Age

Age	Number
67-68	I
65-66	
63-64	III SSSS
61-62	I SSSSS S
59-60	IIIII SSSSS SSSS
57-58	IIIII II SSSSS SSS
55-56	IIIII IIII SSSSS
53-54	IIIII I SSSSS SSS
51-52	IIIII II SSSSS SS
49-50	III SSSSS
47-48	IIIII SSSS
45-46	III SSSS
43-44	IIIII III SSSSS S
41-42	IIIII II SSS
39-40	IIIII I
37-38	IIII S
35-36	IIIII I S
33-34	IIIII
31-32	IIIII I
29-30	
27-28	I

I = Idaho	S = National Group (SDC)	Total Group
N = 93	N = 71	N = 164
M = 44.3	M = 52.1	M = 47.7
Range = 27 to 68	Range = 36 to 64	Range = 27 to 68

Table 2. Frequency Distribution of Number of Teachers Employed

Number	Teachers	Number	Teachers	Number	Teachers
4000	S	300	S	67	I
3000	S	291	S	66	I
2700	S	290	S	65	I
2522	S	275	S	64	I
1800	SS	260	S	60	I
1770	S	256	S	58	I
1445	S	250	I S	53	I
1180	S	232	S	52	I
1120	SS	230	S	51	S
1060	S	226	I	49	II
1030	S	225	S	46	II
1025	S	218	S	44	I
975	S	210	I S	43	S
950	S	207	I	41	I S
923	S	200	III	40	I S
869	S	193	S	37	III
815	I	179	I	36	II
775	S	175	I S	35	II
762	S	170	S	33	I
750	S	160	S	32	IIIII
666	S	152	I	31	I
649	S	150	I SS	29	I
604	S	142	S	28	II
600	S	131	I	27	I
550	I	127	I	26	III
542	S	120	S	25	II
540	S	112	I	24	S
538	S	111	S	22	I
500	SS	110	S	20	II S
498	S	105	I	19	I
475	S	98	I	18	IIII
457	S	91	I	17	IIIII
442	S	90	I	16	III
420	I	89	I	13	IIII
400	S	84	S	12	I
350	S	83	I	11	I
325	S	80	I	9	II
320	S	77	II	8	II
312	S	75	I	6	I
305	S	68	I		

I = Idaho
N = 93

S = National Group (SDC)
N = 71

Total Group
N = 164
Range = 6 to 4000

Table 3. Frequency Distribution of Mean Number of Years Superintendents Remain in Position

Number of Years	Superintendents
28	S
27	I
26	S
25	
24	
23	
22	S
21	I S
20	
19	
18	S
17	S
16	SSSS
15	S
14	I
13	S
12	II
11	I SS
10	IIIII II SSSS
9	I SSS
8	IIIII SSSSS S
7	IIIII II SSSSS
6	IIIII II SSSSS SSSSS SS
5	IIIII III SSSSS SS
4	IIIII IIIII IIIII I SSSSS SSS
3	IIIII IIIII IIIII I SSSSS
2	IIIII IIII SSSSS
1	IIIII IIIII I SS

I = Idaho	S = National Group (SDC)	All Superintendents
N = 93	N = 71	N = 164
M = 5.2	M = 7.9	M - 6.4
Range = 1 to 27	Range = 1 to 28	Range = 1 to 28

Instrumentation

The test battery for gathering data included two innovation attitude scales, an innovation behavior verification scale and Forms A and B of The Sixteen Personality Factor Questionnaire.

The Innovative Measuring Instruments

The innovative measuring instruments measured the superintendent's reaction to 31 innovations, concepts or new ideas in (a) education and (b) life situations. These innovative concepts (Appendix A) were written into a series of items using a Likert-type scale (Selltiz (27). A choice of five responses ranging from "highly essential" to "of little or no value" was used to determine the superintendent's reaction to a particular innovation. The behavior verification scale (Appendix A) was used to verify the implementation of new ideas or innovations in education which the superintendent had actually tried or caused to be put into practice in his school district.

From each scale an innovation score was computed. The scores were then standardized so they could be combined into a composite innovation score. For reliability tests see Appendix A.

The Personality Measuring Instrument

Cattell's Sixteen Personality Factor Questionnaire was employed to study the personality characteristics that may correlate with superintendents' willingness to accept change. Cattell describes this test as follows:

> The 16 P. F. is the psychologist's answer, in the questionnaire realm, to the demand for a test giving fullest information in the shortest time about most personality traits. It is not merely concerned with some narrow concept of neuroticism or adjustment, or some special kind of ability, but sets out to cover planfully and precisely all the main dimensions along which people can differ, according to basic factors analytical research. (Cattell (15).

The 16 P. F. questionnaire, documented in five books and over 100 journal articles, is a test based on factor analysis which measures 16 factors or traits of the respondent's personality. Forms A and B of the 16 P. F., consisting of 187 items each, were used in accordance with Cattell's (15) recommendation. "It is urged that, whenever possible, both forms be used, particularly in research situations and in all cases where maximum precision is needed."

The Sixteen Personality Factor Questionnaire is bi-polar. The personality traits have opposite meaning on two ends of a continuum of 16 primary personality dimensions. For example, and individual scoring low on Factor A would be quite reserved, while an individual scoring high on Factor A would be outgoing. One scoring low on Factor B would be less intelligent and a more concrete thinker, while one scoring high on Factor B would be more intelligent and inclined toward more abstract-thinking. The bi-polar descriptions of scource traits for all 16 factors of the 16 P. F. Test are listed in Appendix B.

Method of Analysis

To test the first hypothesis involving correlation between personality characteristics and willingness to accept change, the multiple correlation (R) was computed. This statistical treatment was selected because it was our assumption that personality characteristics are not independent of each other in their relationship to the innovation scores. That is, the differences in the innovation scores (dependent variable) may have been the combined result of differences in the 16 personality factors (independent variables). This procedure also gave us three applications: (1) it yielded the optimum weighting (beta weights) for combining a series of variables in predicting a criterion and (2) it permitted the analyzing of variation into component parts (McNemar (23) and (3) it was possible to tell what percentages of the dependent variable was accounted for by the combined predictor variables.

To accomplish (2) above, a part variance component was computed which indicated the proportional contribution that one personality factor was making to the differences in the innovation scales (dependent variable) with the contributions of the other 15 personality factors to the dependent variable cancelled out. The F-ratio was used as a test of significance with .05 as the accepted level of significance. Indications are made where significances exceeded the .01 or .001 levels.

Simple linear correlations (Pearson product-moment r) were also computed between all variables. These are displayed in the 21 x 21 correlation matrix in Table 15 of Appendix C.

To test the second hypothesis concerning personality differences between a national (S.D.C.) group of superintendents interested in and involved in innovation and the superintendents from the state of Idaho, an analysis of variance technique was used and an F-ratio computed with .05 as the level of significance.

The third hypothesis concerning personality differences between the most innovative and the least innovative superintendents from the total group was tested by using an analysis

of variance technique computing an F-ratio with .05 as the level of significance.

The fourth hypothesis was tested by using a chi-square test of independence. Superintendents were grouped by age and by placement in a low, medium, or high category based on their composite innovation score.

The fifth hypothesis was also tested by using a chi-square test of independence. Superintendents were grouped by mean number of years in a position and by their placement in a low, medium, or high category based on their composite innovation score.

The sixth hypothesis was tested by using a chi-square test of independence. The superintendents were grouped by size of school districts determined by the number of teachers employed and by their placement in a low, medium, or high category based on their composite innovation score.

RESULTS

Descriptive Data

The data were gathered from two groups, 93 Idaho superintendents and 71 superintendents from 12 states who had been identified as implementors of innovation.

The ages of the Idaho superintendents who agreed to cooperate in the study ranged from 27 to 68 years with a mean age of 44.3. They were the chief administrative officers of school districts ranging in enrollment from 112 to 11,900 students, employing a low of 6 teachers to a high of 815 teachers, and had remained in positions from 1 to 27 years with a mean of 4.2 years. It was earlier assumed that the Idaho superintendents would form a reasonably normal distribution along a continuum of low innovators to high innovators. This was not the case, however, because a large majority of Idaho superintendents fell below the mean for the total group of superintendents. The range for the Idaho group on the composite innovation scores, 80.9 to 205.6, was the same as the total group. The mean for this total group, however, was 150.21, while the mean for the Idaho group was only 140.5. In fact, 70 of 93 superintendents fell at or below the mean of the total group (Table 4).

In addition to the Idaho superintendents, 71 superintendents originally involved in the Systems Development Corporation Study agreed to cooperate. This group was identified as being made up of superintendents with known interest and involvement in educational innovation. They ranged in age from 26 to 64 with a mean age of 52.1. Their district size ranged from the enrollment of 320 students to 91,000 students and 20 teachers to 4,000 teachers. The assumption that these were superintendents with known interest and involvement in educational innovation was confirmed by the fact that a major portion of the superintendents fell above the mean for the total group of 164 superintendents. In fact, their range was from 110.1 to 201.6 and their mean was 162.3.

This descriptive finding helps to explain why, just as we found significant differences in personality characteristics between low innovative superintendents and high innovative superintendents, we likewise found differences between the Idaho superintendents and the national (S.D.C.) superintendents. Additionally, if one notes the personality profiles (Figures 1 and 2) for each of these two groups, the differences in the groups becomes obvious.

It is interesting to note that the Idaho superintendents departed from the normal adult population on only four items, A, B, E and Q_2. Cattell (15) suggests that the range of what we would essentially call average, "normal" scores, namely a

1 sigma range centered on the mean, is represented by 5 and 6. Only when we get to stens of 4 and 7 do we think of a person definitely departing from the average. Among the four factors that go beyond stens of 5 and 6 only one, factor B, reaches a sten of 7. In no case do the other three factors go beyond sten 5 or 6 by more than a third of a sten score.

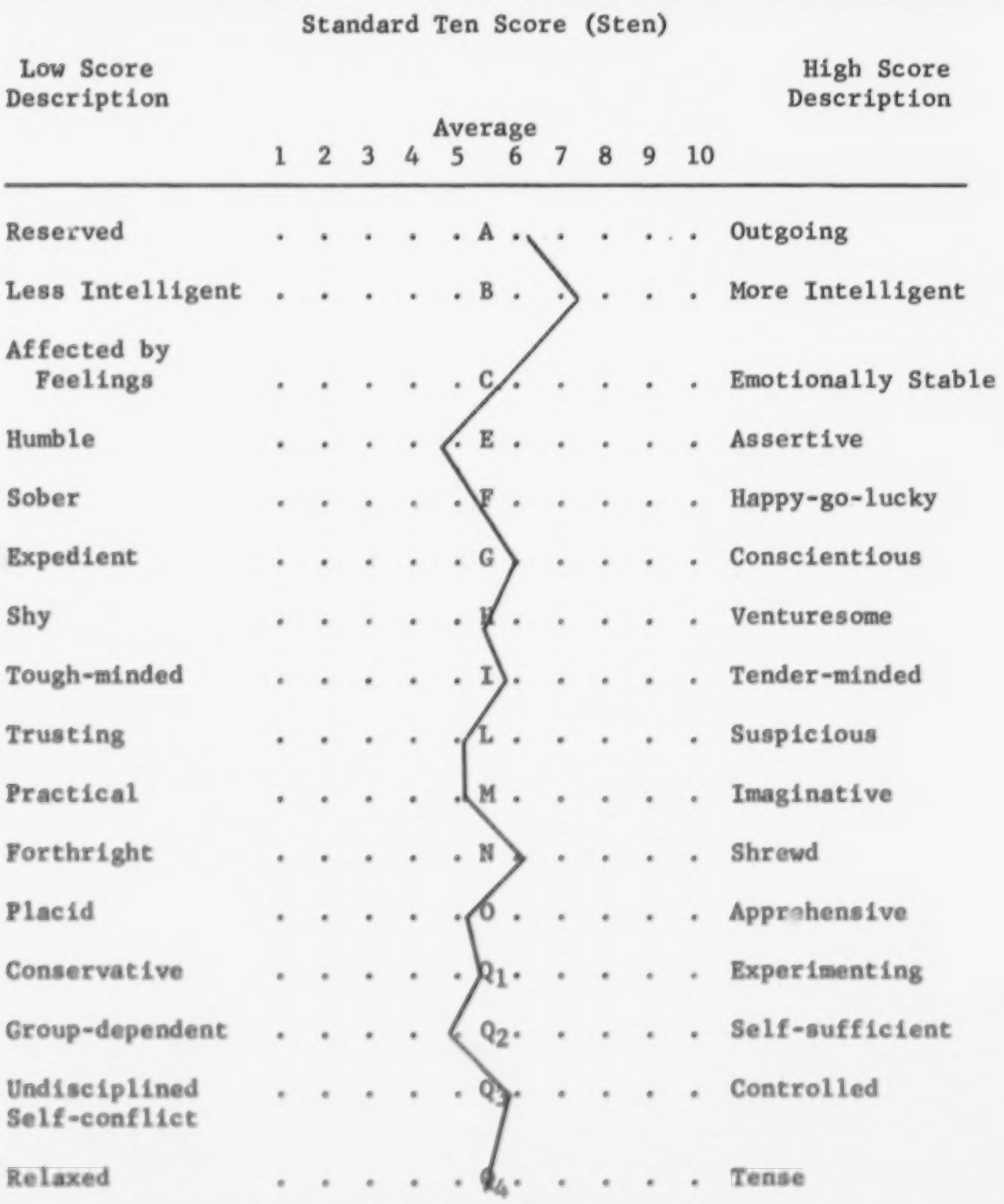
On the other hand, examination of the profile (Figure 2) for the national (S.D.C.) group reveals a definite departure from the average. In fact, there are only 4 of the 16 personality factors for which the mean sten score stays within the average range of 5 to 6. These two findings indicate that two definitely different groups of superintendents were involved. One can conclude, then, that the Idaho superintendents do not depart from the average adult population in terms of personality characteristics, while the S.D.C. group of superintendents or those identified as having an interest in innovation definitely do depart from the average adult population in regard to personality factors.

Table 4. Frequency Distribution of Composite Innovation Scores for All Superintendents

198 - 207	S II
189 - 197	SSSS
180 - 188	SSSSS SSSSS III
171 - 179	SSSSS SSSSS S III
162 - 170	SSSSS SSSSS SSS IIIII I
153 - 161	SSSSS SSSSS S IIIII IIII
144 - 152	SSSSS SSSSS SS IIIII IIIII IIII
135 - 143	SSS IIIII IIIII IIIII II
126 - 134	SS IIIII IIIII IIIII II
117 - 125	SS IIIII IIIII IIII
108 - 116	SS IIII
99 - 107	III
90 - 98	
81 - 89	I

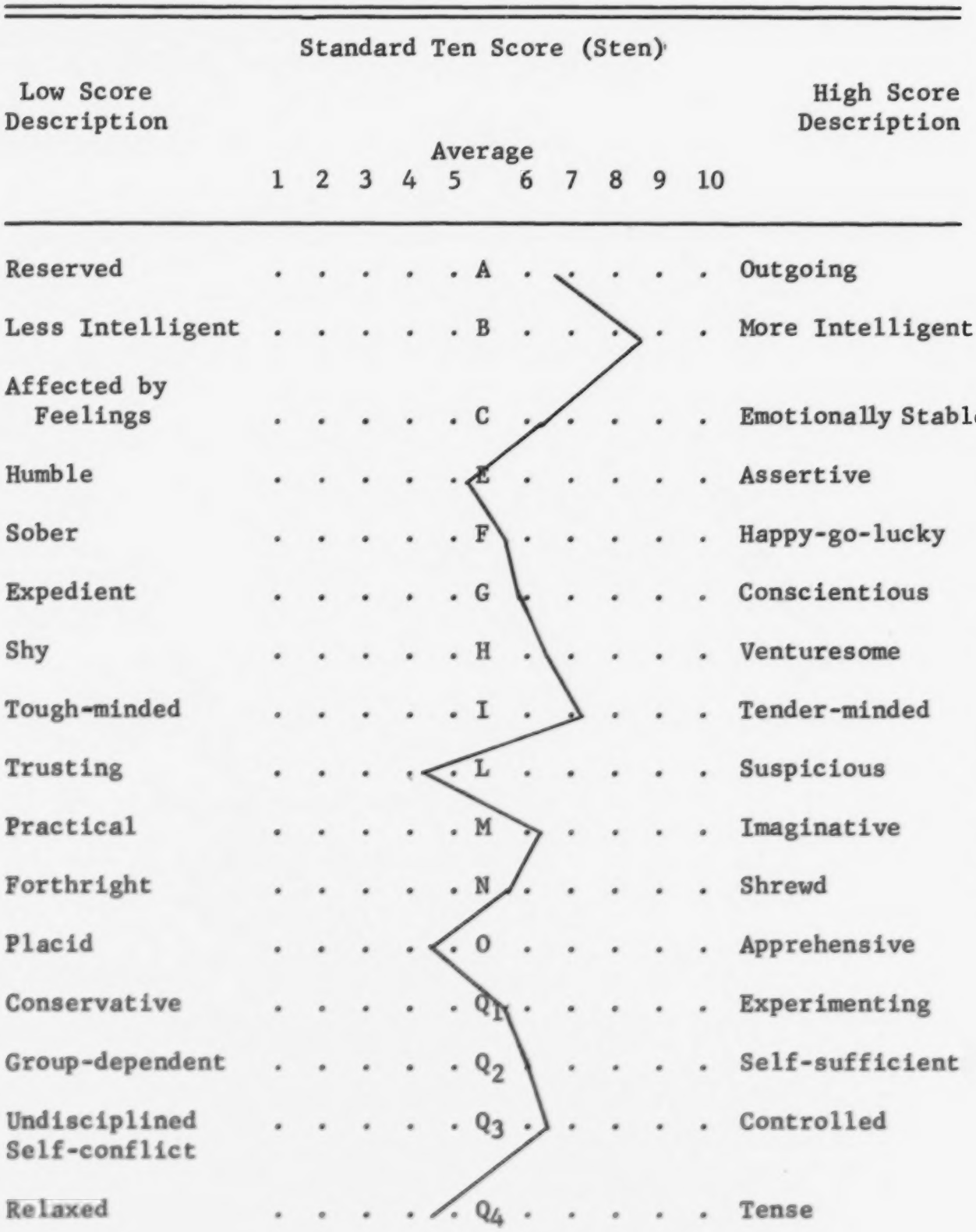
N = 164
M = 150.21
Range = 80.9 to 205.6
Maximum score possible = 238.12
Minimum score possible = 47.78

Figure 1. The 16 P. F. Questionnaire Mean Personality Profile of Idaho Superintendents



Profile prepared from sten scores adjusted to the age of the superintendent.

Figure 2. The 16 P. F. Questionnaire Mean Personality Profile of the National Superintendents (S.D.C.)


Standard Ten Score (Sten)
Low Score Description
High Score Description
Average
1 2 3 4 5 6 7 8 9 10
Reserved . . . . . A . . . . . Outgoing
Less Intelligent . . . . . B . . . . . More Intelligent
Affected by Feelings . . . . . C . . . . . Emotionally Stable
Humble . . . . . E . . . . . Assertive
Sober . . . . . F . . . . . Happy-go-lucky
Expedient . . . . . G . . . . . Conscientious
Shy . . . . . H . . . . . Venturesome
Tough-minded . . . . . I . . . . . Tender-minded
Trusting . . . . . L . . . . . Suspicious
Practical . . . . . M . . . . . Imaginative
Forthright . . . . . N . . . . . Shrewd
Placid . . . . . O . . . . . Apprehensive
Conservative . . . . . Q1 . . . . . Experimenting
Group-dependent . . . . . Q2 . . . . . Self-sufficient
Undisciplined Self-conflict . . . . . Q3 . . . . . Controlled
Relaxed . . . . . Q4 . . . . . Tense

Profile prepared from sten scores adjusted to the age of the superintendent.

Testing of Hypotheses

Hypothesis No. 1:

The correlation of personality with degree of innovation. "Personality characteristics of superintendents as measured by the 16 P. F. are not significantly correlated with the superintendents' willingness to accept change as measured by the responses to innovation scales."

To test this hypothesis, multiple correlations were computed between each of the innovation scores (education beliefs, life beliefs, and educational practices, and composite innovation score) and the 16 personality factors. These were computed by using sten scores for the personality factors that had been adjusted to the age of each superintendent. This adjustment as well as the multiple R computations were made with computer programs available at I.P.A.T. Southern under the direction of Dr. Herbert W. Eber. Table 5 shows the multiple R's computed from these correlations, the consequent variance and the F-ratio which determines the significance of the multiple R. The educational belief score, the educational practice score and the composite innovation score all had a multiple R that was significant. The education belief score was significant at the .01 level while the educational practice score and the composite innovation score were significant at the .001 level.

A multiple correlation of .45 between the education belief score and the 16 personality factors indicates that 20 percent of the variability in the educational belief score can be accounted for by the 16 personality factors. It should be noted, however, that 27 percent of the variability of the educational practice score and the composite innovation score can be accounted for by the 16 personality factors. This is computed from a multiple R of .52 in both cases. On the basis of these results, we must reject the hypothesis and accept the alternative that there is a significant correlation between the superintendents' willingness to accept change and his personality characteristics.

The part variance components shown in Tables 6, 7, 8 and 9 indicate the proportional contribution that each personality factor is making to the differences in the respective dependent variables of educational belief, life belief, educational practice and composite innovation score. This proportional contribution is computed with the contribution of the other 15 personality factors to the dependent variable cancelled out. The F-ratio shown in these tables is a test of the significance of the contribution of the part variance components to the dependent variables.

Table 6 reveals that six of the personality factors contribute significantly to the differences in the education belief innovation score: F- (sober, happy-go-lucky), H (shy, venturesome), I (tough-minded, tender-minded), L (trusting, suspicious), O- (placid, apprehensive), Q_4- (relaxed, tense). Note that three factors, I, L and Q_4 are significant at the .001 level. The reader should note that the minus sign following the letter designation for the personality factor indicates that the low score of this particular factor predicts a high innovation score, thus on Q_4- the more innovative superintendent is more apt to be relaxed rather than tense.

Table 5. Multiple Correlations Between 16 Personality Factors and Four Dependent Innovation Variables

Dependent Variable	R	Variance	F
Education Belief Score	.45	.20	2.374 **
Life Belief Score	.35	.12	1.303
Educational Practice Score	.52	.27	3.426 ***
Composite Innovation Score	.52	.27	3.410 ***

* Alpha = .05 df = 16/147 R: F ≥ 1.67

** Alpha = .01 df = 16/147 R: F ≥ 2.05

*** Alpha = .001 df = 16/147 R: F ≥ 2.54

Table 6. Beta Weights and Part Variance Components Computed from Correlating Each Personality Factor and the Educational Belief Innovation Score

Personality Factor	Beta Weight	Part Variance Component	F
A	0.05	0.00	0.7307
B	-0.02	[a](-)0.00	0.1216
C	-0.03	(-)0.00	0.2022
E	0.08	0.00	1.5693
F	-0.21	(-)0.05	9.1716 **
G	-0.01	(-)0.00	0.0548
H	0.16	0.03	5.2796 *
I	0.31	0.11	20.1794 ***
L	0.38	0.15	30.0888 ***
M	0.10	0.01	2.1946
N	0.08	0.00	1.3814
O	-0.14	(-)0.02	4.2436 *
Q_1	-0.04	(-)0.00	0.4502
Q_2	-0.04	(-)0.00	0.4063
Q_3	-0.02	(-)0.00	0.1774
Q_4	-0.28	(-)0.09	16.4243 ***

* Alpha = .05 df = 1/162 R: F $\geq$ 3.84

** Alpha = .01 df = 1/162 R: F $\geq$ 6.64

*** Alpha = .001 df = 1/162 R: F $\geq$ 10.83

a) The (-) sign is associated with the part correlation from which the part variance components was computed. It means that to the extent that this part correlation exists at all, it is negative.

Table 7. Beta Weights and Part Variance Components Computed From Correlating Each Personality Factor and the Life Belief Score

Personality Factor	Beta Weight	Part Variance Component	F
A	0.18	0.03	6.4512 *
B	0.07	0.00	0.9604
C	-0.22	[a](-)0.05	9.7626 **
E	-0.02	(-)0.00	0.1121
F	-0.05	(-)0.00	0.5775
G	-0.00	(-)0.00	0.0025
H	-0.02	(-)0.00	0.0948
I	0.02	0.00	0.1452
L	0.22	0.05	8.9600 **
M	0.15	0.02	4.5355 *
N	0.00	0.00	0.0000
O	-0.05	(-)0.00	0.5730
Q_1	-0.00	(-)0.00	0.0081
Q_2	-0.09	(-)0.01	1.7957
Q_3	0.09	0.00	1.6312
Q_4	-0.37	(-)0.13	25.6304 ***

* Alpha = .05 df = 1/162 R: F $\geq$ 3.84

** Alpha = .01 df = 1/162 R: F $\geq$ 6.64

*** Alpha = .001 df = 1/162 R: F $\geq$ 10.83

a) The (-) sign is associated with the part correlation from which the part variance components was computed. It means that to the extent that this part correlation exists at all, it is negative.

Table 8. Beta Weights and Part Variance Components Computed From Correlating Each Personality Factor and the Educational Practice Score

Personality Factor	Beta Weight	Part Variance Component	F
A	-0.08	a(-)0.00	1.6360
B	0.15	0.03	5.2856 *
C	-0.10	(-)0.01	2.4619
E	0.17	0.03	6.5107 *
F	-0.16	(-)0.03	6.0424 *
G	0.01	0.00	0.0641
H	0.22	0.06	10.8612 ***
I	0.20	0.05	9.5928 **
L	0.11	0.01	2.7651
M	0.04	0.00	0.3666
N	-0.14	(-)0.02	4.7732 *
O	-0.04	(-)0.00	0.5255
Q_1	0.10	0,01	2.3264
Q_2	-0.03	(-)0.00	0.2360
Q_3	0.15	0.03	5.1098 *
Q_4	-0.12	(-)0.02	3.7185

* Alpha = .05 df = 1/162 R: F ≥ 3.84

** Alpha = .01 df = 1/162 R: F ≥ 6.64

*** Alpha = .001 df = 1/162 R: F ≥ 10.83

a) The (-) sign is associated with the part correlation from which the part variance components was computed. It means that to the extent that this part correlation exists at all, it is negative.

Table 9. Beta Weights and Part Variance Components Computed from Correlating Each Personality Factor and the Composite Innovation Score

Personality Factor	Beta Weight	Part Variance Component	F
A	0.06	0.00	1.0814
B	0.08	0.01	1.7093
C	-0.15	a(-)0.03	5.6256 *
E	0.10	0.01	2.2764
F	-0.18	(-)0.04	7.7839 **
G	-0.00	(-)0.00	0.0004
H	0.15	0.03	5.4177 *
I	0.23	0.07	12.6874 ***
L	0.31	0.11	21.4516 ***
M	0.13	0.02	3.7844
N	-0.02	(-)0.00	0.1683
O	-0.10	(-)0.01	2.5995
Q_1	0.02	0.00	0.1021
Q_2	-0.07	(-)0.00	1.2744
Q_3	0.09	0.01	1.9561
Q_4	-0.34	(-)0.13	25.7056 ***

* Alpha = .05 df = 1/162 R: F $\geq$ 3.84

** Alpha = .01 df = 1/162 R: F $\geq$ 6.64

*** Alpha = .001 df = 1/162 R: F $\geq$ 10.83

a) The (-) sign is associated with the part correlation from which the part variance components was computed. It means that to the extent that this part correlation exists at all, it is negative.

It should be noted that even though the 16 personality factors did not have a significant multiple correlation with the life belief score, there were five part variance components that made a significant contribution to the differences in the life belief score with a contribution of the other 15 personality factors cancelled out. These factors were A (reserved, outgoing), C- (affected by feelings, emotionally stable), L (trusting, suspicious), M (practical, imaginative), Q_4- (relaxed, tense). Q_4- was significant at the .001 level while C- and L were significant at the .01 level.

Because the educational practice score was an attempt to measure what the superintendent had actually innovated in his school district, rather than what he believed about changes in education, the significant multiple R of .52 becomes extremely important. Likewise, the personality factors which have a significant part variance component are important. There were seven of the factors making a significant contribution to the dependent variable, educational practice. Each of these part variance components were derived from a correlation coefficient which was computed while cancelling out the effect of the other 15 variables on the educational practice score. The seven personality factors making a significant contribution were: B (less intelligent, more intelligent), E (humble, assertive), F- (sober, happy-go-lucky), H (shy, venturesome), I (tough-minded, tender-minded), N- (forthright, shrewd), and Q_3 (undisciplined self conflict, controlled). Note that H was significant at the .001 level and I was significant at the .01 level.

It is likewise important to note the high multiple R (.52) resulting from a correlation of the composite innovation score and the 16 personality factors. In turn, we find that there are six of the 16 personality factors making a significant contribution to the composite innovation score, each contribution being computed while cancelling out the effect of the other 15 factors. The six factors were: C- (affected by feelings, emotionally stable), F- (sober, happy-go-lucky), H (shy, venturesome), I (tough-minded, tender-minded), L (trusting, suspicious), Q_4- (relaxed, tense). It should be further noted that three of these, I, L, and Q_4- were significant at the .001 level.

For those interested in the optimum weighting for combining all of the 16 personality factors in predicting a score on any one of the four innovation scores, they should refer to the beta weights listed in Tables 6, 7, 8 and 9. For readers interested in the simple linear correlations between the 16 personality factors and the various innovation scores, they should refer to either the 21 by 21 correlation matrix in Table 15 of Appendix C

or the summary of these correlations in Tables 16, 17, 18 and 19 of Appendix C.

Hypothesis No. 2:

Personality differences between the national group of superintendents and the Idaho superintendents. "The 16 P. F. mean scores of superintendents described as being interested in and implementors of innovation by the Systems Development Corporation Study will not differ significantly from the 16 P. F. mean scores of Idaho superintendents."

To test this hypothesis, an analysis of variance technique was used and an F-ratio computed to compare the raw score means of each personality factor for the S. D. C. group and the Idaho group. Table 10 reveals significant differences exist at the .05 level between the S. D. C. superintendents and the Idaho superintendents on 10 of the 16 personality factors. Significant differences were found between the two groups for the following factors: B (less intelligent, more intelligent), C (affected by feelings, emotionally stable), E (humble, assertive), H (shy, venturesome), L (trusting, suspicious), M (practical, imaginative), O (placid, apprehensive), Q_1 (conservative, experimenting), Q_3 (undisciplined, controlled), and Q_4 (relaxed, tense). It should be noted also that five of the ten were significant to the .001 level and one of the nine was significant to the .01 level, therefore, for these ten characteristics, the null hypothesis is rejected and it may be concluded that significant differences do exist between the personality characteristics of the superintendents of the national group (S.D.C.) and the Idaho superintendents.

The mean profiles in Figure 3 clearly show the direction of these differences and the extent of the differences in sten scores. It is interesting to note that the national group (S.D.C.) is more intelligent, more emotionally stable, more humble, more venturesome, more trusting, more imaginative, more placid, more experimenting, more controlled and more relaxed than the Idaho group.

Hypothesis No. 3:

Personality differences between superintendents of the highest and lowest innovation scores. "The 16 P. F. scores of superintendents in both groups scoring plus 1 standard deviation or more on composite innovation scores will not differ significantly from the 16 P. F. scores of superintendents scoring minus 1 standard deviation or more on the composite innovation scores."

To test this hypothesis, an analysis of variance technique was used and an F-ratio computed to compare the raw score means of each personality factor for the high innovative group and the

Table 10. Comparison of Raw Score Means of Personality Factors for Idaho Superintendents and S. D. C. Group

Personality Factor	National (S.D.C.) Group (1)		Idaho Group (2)		F Ratio
	Mean Score n=71	Standard Deviation	Mean Score n=93	Standard Deviation	
A	22.8	6.3	22.0	6.2	.66
B	18.2	2.5	16.9	2.7	10.71 **
C	36.2	5.6	33.9	5.9	6.62 *
E	24.7	5.8	22.8	6.3	4.30 *
F	26.0	7.8	24.7	3.9	1.20
G	30.9	4.0	30.0	4.3	3.05
H	33.9	7.3	28.2	9.0	18.69 ***
I	21.4	5.2	20.0	4.6	3.51
L	14.8	5.3	17.5	4.7	11.70 ***
M	22.5	5.3	20.7	4.8	5.49 *
N	22.3	3.8	21.9	4.3	.48
O	17.2	5.5	20.3	6.2	11.02 ***
Q_1	22.8	4.8	19.9	3.9	18.87 ***
Q_2	18.4	4.8	18.3	4.7	2.54
Q_3	26.0	4.0	24.5	4.6	4.77 *
Q_4	17.4	6.8	22.7	7.8	21.31 ***

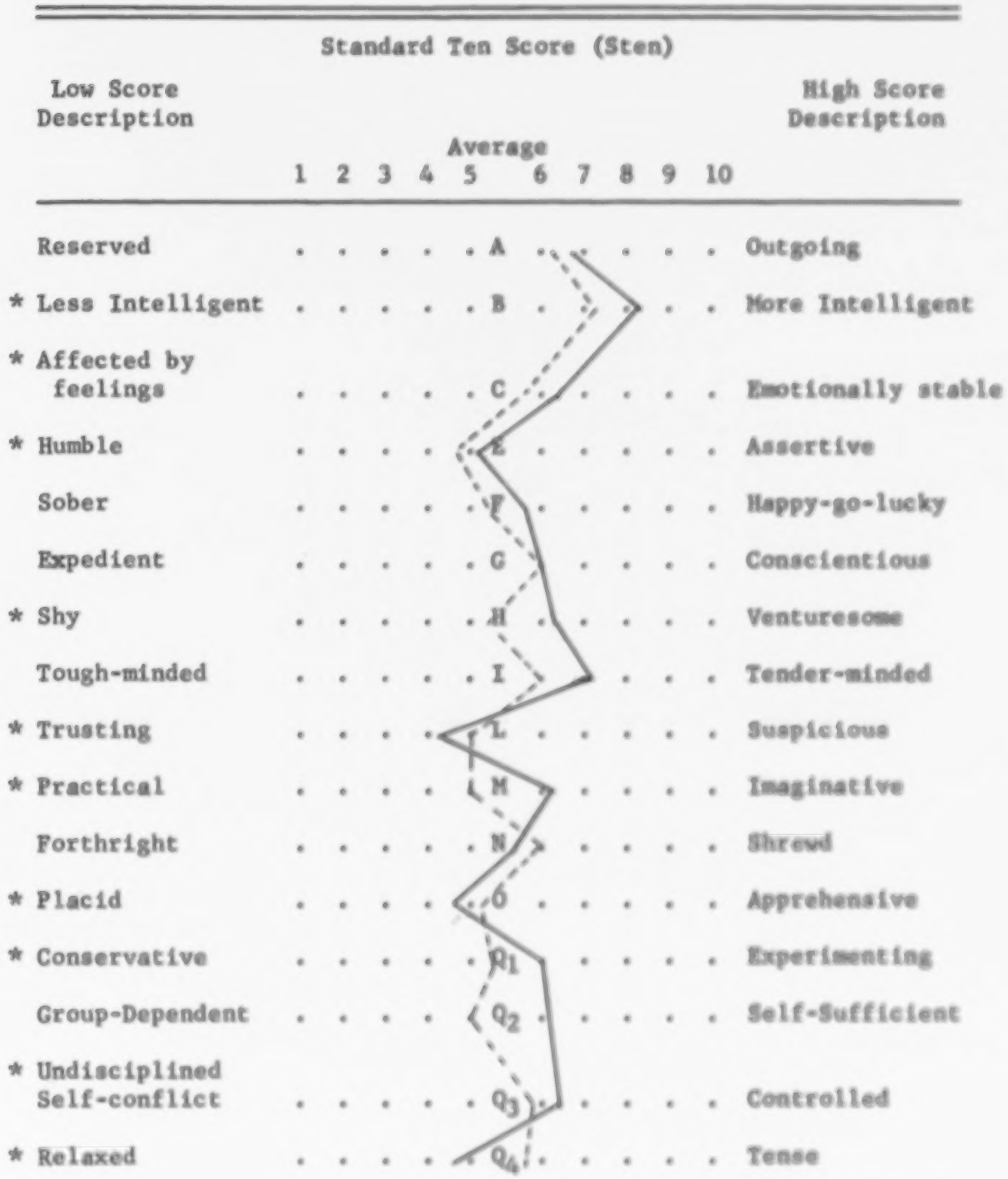
H: $\mu_1 = \mu_2$

* Alpha = .05 df = 1/162 R: F > 3.84

** Alpha = .01 df = 1/162 R: F > 6.64

*** Alpha = .001 df = 1/162 R: F > 10.83

Figure 3. A Comparison of the Mean Personality Profiles for National (S.D.C.) Superintendents and Idaho Superintendents



_____ = National (S.D.C.) Superintendents, n = 71

- - - - - - - - - = Idaho Superintendents, n = 93

* Significant differences, Alpha = .05 (Sten score adjusted to the age)

low innovative group. The mean for the high innovative group was computed from the scores of 31 superintendents whose innovation scores ranged from 173.2 to 205.9 (plus 1 standard deviation or more). The low innovative group was made up of 30 superintendents whose range was from 80.7 to 126.4 (minus 1 standard deviation or more). Table 11 shows that significant differences do exist between superintendents with high innovation scores and those with low innovation scores on six personality factors. These factors are: A (reserved, outgoing), E (humble, assertive), H (shy, venturesome), M (practical, imaginative), Q_1 (conservative, experimenting) and Q_4 (relaxed, tense). Notice also that two of the six were significant to the .001 level and two of the six were significant to the .01 level. Therefore, for these six characteristics, the null hypothesis is rejected and it may be concluded that differences do exist between superintendents with high innovation scores and superintendents with low innovation scores.

Figure 4 clearly shows the direction of these differences and the extent of the differences in sten scores. Note that the innovative group is more outgoing, more assertive, more venturesome, more imaginative, more experimenting and more relaxed than the low innovative group.

Hypothesis No. 4:

The association between age and willingness to accept change. "The age of superintendents is not significantly associated with their willingness to accept change as measured by innovation scales."

To test this hypothesis, the superintendents were classified into three age groups and three innovation groups and a chi-square was computed. The age groups, as shown in Table 12, ranged from the youngest superintendent who was 27, to the oldest at 68. The The superintendents were also grouped into three innovation groups: high, middle, and low, as shown in Table 12.

The chi-square obtained was 4.40 with four degrees of freedom. This chi-square is below the 9.49 needed for significance at the .05 level. Therefore, the null hypothesis is accepted. It can be concluded that the age of superintendents is not related to their willingness to accept change.

Hypothesis No. 5:

The association between mean years in a position and willingness to accept change. "The mean number of years superintendents remain in a position is not significantly associated with their willingness to accept change as measured by innovation scales."

Table 11. Comparison of Raw Score Means of Personality Factors for 30 Low Innovative Superintendents and 31 High Innovative Superintendents.

Personality Factor	(1) Low Innovators		(2) High Innovators		F Ratio
	Mean Score n=30	Standard Deviation	Mean Score n=31	Standard Deviation	
A	20.8	6.5	24.6	6.6	4.96*
B	17.5	2.5	17.6	2.4	3.20
C	33.8	4.6	36.3	6.4	2.93
E	22.0	6.5	25.6	5.3	5.65*
F	24.7	8.0	27.2	6.9	1.68
G	30.6	3.9	31.5	4.4	.73
H	27.8	9.5	35.2	6.6	12.31***
I	19.7	4.7	31.5	5.6	1.49
L	17.0	4.4	15.2	5.1	2.12
M	19.7	3.5	24.0	5.0	15.42***
N	21.3	4.4	23.5	4.3	3.85
O	20.1	5.5	18.1	7.0	1.48
Q^1	20.0	3.9	23.3	5.0	7.93**
Q^2	17.9	5.2	18.1	5.1	1.58
Q^3	24.6	4.4	25.4	4.1	.52
Q^4	23.4	8.0	17.4	7.5	8.96**

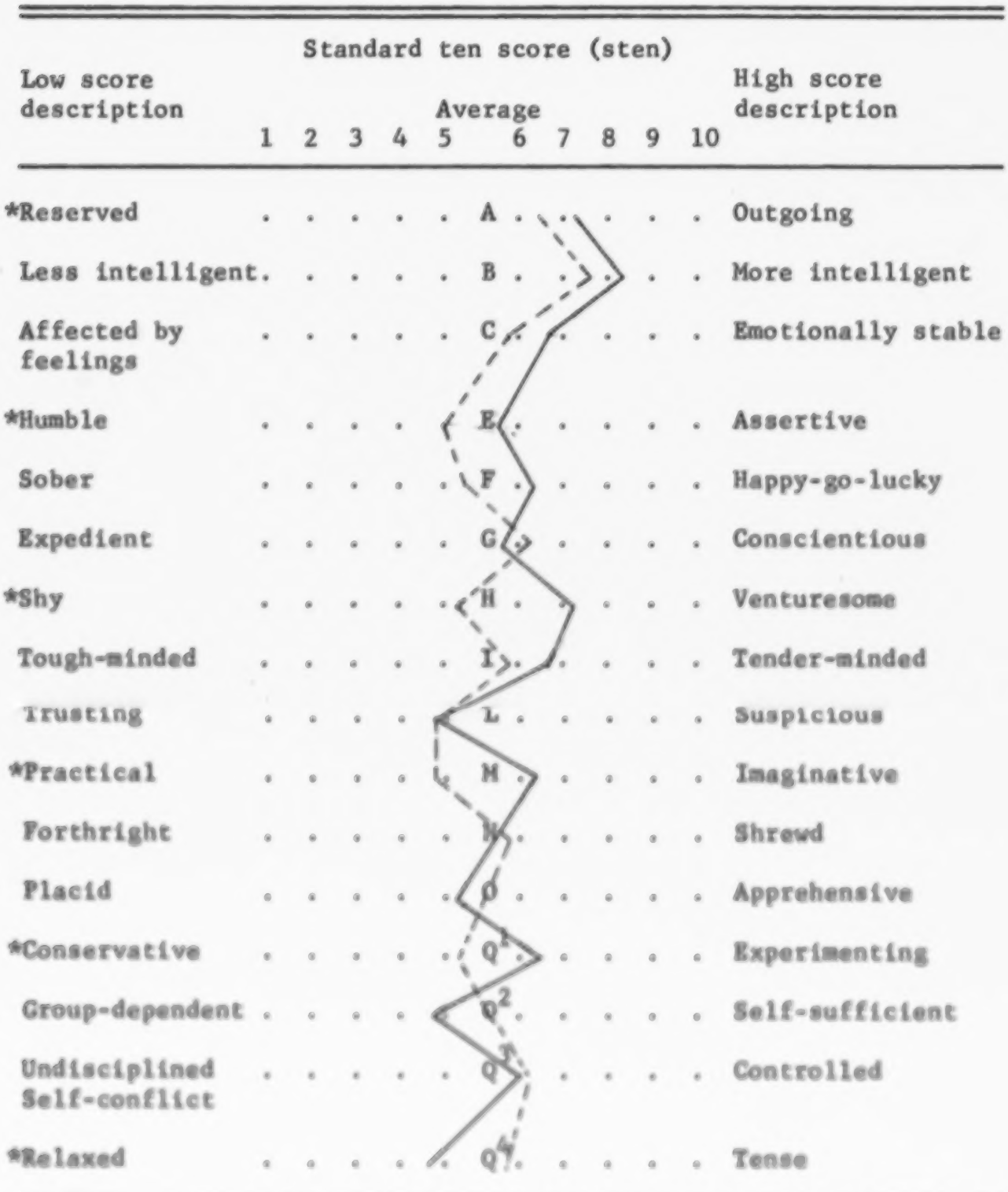
H_0: $\mu_1 = \mu_2$

* Alpha = .05
df = 1/59
R: F > 4.00

** Alpha = .01
df = 1/59
R: F > 7.08

*** Alpha = .001
df = 1/59
R: F > 11.97

Figure 4. A comparison of the Mean Personality Profiles for 30 Low Innovative Superintendents and 31 High Innovative Superintendents



_____ = High Innovative Superintendents (more than +1 ρ), n=31
---------- = Low Innovative Superintendents (more than -1 ρ), n=30

* Significant differences, Alpha = .05

Profile prepared from sten scores adjusted to the age of the superintendent.

Table 12. Relationship Between Age and Degree of Innovativeness

Level of Innovation	Age			Total	Percent
	27 - 40	41 - 54	55 - 68		
High Innovators 173.2-205.9	2 - (5.5)	15 + (14.5)	14 + (11.0)	31	19
Middle Innovators 127.0-172.8	20 + (18.1)	50 + (48.6)	33 - (36.3)	103	63
Low Innovators 80.7-126.4	7 + (5.3)	12 - (14)	11 + (10.7)	30	18
Total	29	77	58	164	
Percent	18	47	35		100

H: Variables are independent

Alpha = .05
df = 4
R: $\chi^2 \geq 9.49$
Computed $\chi^2 = 4.40$
Accept the hypothesis

NOTE: The top number in each cell represents the observed frequency. The number in the parentheses is the expected frequency. The plus or minus sign in each cell indicates respectively that the observed frequency is larger or smaller than the expected frequency.

To test this hypothesis, a chi-square was computed with superintendents categorized into three groups by mean number of years they remained in a position (1 to 4 years, 5 to 9 years, and 10 years and over) and three innovation levels (high, middle, and low) as shown in Table 13.

The chi-square computed was 6.13 with four degrees of freedom. The chi-square is below the 9.49 needed for significance at the .05 level. Therefore, the null hypothesis is accepted. It can be concluded that the superintendents mean number of years in a position is not related to his willingness to accept change.

Hypothesis No. 6:

The association between the size of the superintendents' school district as indicated by the number of teachers employed and willingness to accept change. "The size of the school district is not significantly associated with the superintendents' willingness to accept change as measured by innovation scales."

To test this hypothesis a chi-square was computed with superintendents categorized into three groups based on the number of teachers employed in the school district and three innovation levels (high, middle and low) as shown in Table 14. The school district size groupings were 6 to 249 teachers, 250 to 999 teachers and 1,000 teachers and over; the innovation groups were those employed in preceding hypotheses.

The chi-square obtained was 19.51 with four degrees of freedom. This chi-square is above the 9.49 needed for significance at the .05 level. The null hypothesis is therefore rejected and it can be concluded that the size of the school district is significantly associated with the superintendents' willingness to accept change as measured by innovation scales.

Table 13. The Relationship Between Mean Years in a Position and Willingness to Accept Change

Level of Innovation	Mean Years in Position 1 - 4	5 - 9	10 - --	Total	Percent
High Innovators 173.2-205.9	8 - (13.1)	13 + (12.0)	10 + (5.9)	31	19
Middle Innovators 127.0-172.8	47 + (43.2)	40 - (40.4)	16 - (19.4)	103	63
Low Innovators 80.7-126.4	14 + (12.7)	11 - (11.6)	5 - (5.7)	30	18
Total	69	64	31	164	
Percent	42	39	19		100

H: Variables are independent

Alpha = .05
df = 4
R: $\chi^2 \geq 9.49$
computed $\chi^2 = 6.13$
Accept the hypothesis

NOTE: The top number in each cell represents the observed frequency. The number in the parentheses is the expected frequency. The plue or minus sign in each cell indicates respectively that the observed frequency is larger or smaller than the expected frequency.

Table 14. Relationship Between the Size of the Superintendents School District as Indicated by the Number of Teachers Employed and Willingness to Accept Change

Level of Innovation	Number of teachers employed			Total	Percent
	6 - 249	250 - 999	1000 - --		
High Innovators 173.2-205.9	7 + (2.7)	11 + (7.2)	13 - (21.1)	31	19
Middle Innovators 127.0-172.8	7 - (8.8)	25 + (24.8)	71 + (69.4)	103	63
Low Innovators 80.7-126.4	0 - (2.6)	3 - (7.0)	27 + (20.4)	30	18
Total	14	39	111	164	
Percent	9	23	68		100

H: Variables are independent

Alpha = .05
df = $_2$4
R: χ^2 ≥ 9.49
Computed χ^2 = 19.51
Accept the hypotheses

NOTE: The top number in each cell represents the observed frequency. The number in the parentheses is the expected frequency. The plus or minus sign in each cell indicates respectively that the observed frequency is larger or smaller than the expected frequency.

DISCUSSION, CONCLUSIONS AND IMPLICATIONS

The purpose of this research was to determine whether a relationship exists between personality characteristics of school superintendents and their willingness to accept innovation or new ideas in education. This was done primarily through concern for two general areas, first, the correlation of personality factors as determined by Cattell's 16 P. F. Questionnaire with the superintendents' score on an innovation scale and, secondly, the separation of the superintendents into two extreme groups of acceptance of innovation and testing for differences in personality characteristics. We felt further that is was important to provide some descriptive data of the superintendents, their general degree of innovativeness and also to find out if there were correlations between the degree of innovativeness and such factors as age, size of the school district in which the superintendent is the educational leader, and the number of years that the superintendent has stayed in a given position. Specifically, the following six hypotheses were tested:

1. Personality characteristics of superintendents as measured by the 16 P. F. are not significantly correlated with the superintendents' willingness to accept change as measured by their responses to innovation scales.

2. The 16 P. F. scores of superintendents as described as being interested in and implementors of innovation by the Systems Development Corporation Study will not differ significantly from the 16 P. F. scores of Idaho superintendents.

3. The 16 P. F. scores of all superintendents in this study scoring + 1 standard deviation or more on composite innovation scores will not differ significantly from the 16 P. F. scores of superintendents in both groups scoring - 1 standard deviation or more on composite innovation scores.

4. The age of superintendents is not significantly associated with their willingness to accept change as measured by innovation scales.

5. The mean number of years superintendents remain in a position is not significantly associated with their willingness to accept change as measured by innovation scales.

6. The size of the school district is not significantly associated with the superintendents willingness to accept change as measured by innovation scales.

The assumption that the Idaho superintendents would be normally distributed along a continuum from low innovators to high innovators did not hold true. As a group, the Idaho superintendents were clustered below the mean of the entire group. As a matter of fact, their mean was 140.5 compared to the mean of the entire group at 150.21. The mean for the Idaho group would have been even smaller had it not been for several isolated cases who scored high on the innovation scale. In fact, 70 out of the 93 Idaho superintendents fell at or below the mean for the entire group.

On the other hand, our assumption about the national (S.D.C.) group being interested in and implementors of innovation did hold true, because according to our innovation scale, 62 out of the 71 who agreed to participate fell at or above the mean for the entire group. This helps to explain why we found significant differences in the personality characteristics of Idaho superintendents when compared to the national (S.D.C.) group as well as finding significant differences between the high innovative and the low innovative groups. Obviously, these two comparisons involved primarily the same people.

The lack of acceptance of new ideas in education as well as the implementation of new ideas in Idaho becomes understandable when one examines the personality profiles of Idaho superintendents. On the assumption that the implementation of changes in education requires a certain amount of leadership and thus unique characteristics on the part of the superintendent, one would expect that people in leadership positions would deviate somewhat from the average adult population in personality characteristics. Our findings indicate, however, that the Idaho superintendents did not deviate from the average adult population except slightly on four characteristics. Only on factor B+ (intelligence) did the mean go beyond sten 7. None of the other four reached sten 4 or 7. If one continues to accept the assumption regarding leadership, it becomes understandable why the S.D.C. group is able to implement and accept innovations. Their mean personality profile shows that in 12 out of the 16 factors, they definitely deviate from the average adult population.

Correlations and Differences

Using data from all 164 superintendents, our research showed that educational beliefs (R = .45), educational practices (R = .52) and a composite innovation score (R = .52) had a significant multiple correlation with the 16 personality factors as measured by Cattell's 16 P. F. Questionnaire. It can be concluded, then, that personality characteristics do correlate significantly with the superintendents' willingness to accept change as measured by the responses to innovation scales. We

were further interested in those factors which made a significant contribution to the differences in the innovation scores. The reader can refer to the earlier tables and text to find the significant factors in the correlations between educational beliefs and life beliefs and the 16 personality factors. At this point in the discussion, however, we feel that it is important to call attention to the factors involved in the educational practice score and the composite innovation score.

The educational practice score is extremely important because this was an attempt to measure what the superintendents had actually innovated in their school district rather than merely what they believed about changes in education. It is important to note that this significant multiple correlation of .52 means that we can account for 27 percent of the variability practice score by the 16 personality factors. The seven personality factors making a significant contribution were: B (less intelligent, more intelligent), E (humble, assertive), F- (sober, happy-go-lucky), H (shy, venturesome), I (tough-minded, tender-minded), N- (forthright, shrewd), and Q_3 (undisciplined self-conflict, controlled). This contribution was computed from a part correlation which correlated each factor with the educational practice score while cancelling out the effect of the other 15 factors on the educational practice score.

It can be concluded,then, that these seven personality traits should be given high consideration in the development of an equation for predicting innovative superintendents. It is commonly agreed that personality tests are the quickest and most effective means for assessing personality characteristics. If, on the other hand, a person had to select innovators and did not have the results of a personality instrument, he should at least be familiar with the essential traits and their meaning. Perhaps, then, he could, through subjective means, better predict innovative administrators.

To lead the reader to a broader understanding of the seven traits found to contribute significantly, we have provided the following discussion.

Cattell (15) suggests that there is a moderate tendency for more intelligent people (B+), that is, those who score high on factor B, "to have somewhat more morale, preistance and strength of interest." This is in a sense, he suggests, a good general ability measure. He found, also, that leading researchers in physics, physiology and biology were more intelligent than the general population as were executives in academic administrative positions.

Factor E, that is dominance versus submission, is the well-known factor which has been investigated by Maslow, Allport and others in human beings. Cattell (15) suggests that groups averaging high on this factor show more effective role interaction and democratic procedure, that is, they feel free to participate, they raise group problems, and they criticize group defects. Among occupations, it is most associated with those requiring boldness and courage. Cattell's work (15) has shown that it is a valuable characteristic for firemen and airmen. Recently there has been conjecture that inovators must be people who are willing to take risks. Perhaps, then, there is an element of similarity between the risk that firemen, airmen and innovative educators must take. Just as we found factor E a significant contributor to those who implement innovative practice, Cattell (15) found that eminent researchers were more dominant (E+) as were people successful in academic administrative positions. Hinman (20) in her study of personality characteristics of principals, found that those who implement innovation are also high on factor E. Hemphill (19) from his research on elementary school principals suggests that a person who is high in administrative performance regarding the perception of long range or broad ramifications of specific administrative problems, requires dominance (E+).

On factor F, Cattell (15) suggests that surgent (F+) people, "have generally had an easier, less punishing, more optimism-creating environment, or that they have a more happy-go-lucky attitude through less exacting aspirations." He also found that elected leaders are far higher than followers on surgency, but the difference is scarcely significant for effective leaders. It is interesting to note that to the degree that F correlates with educational practice, it correlates negatively. That is, those who have a higher practice score are apt to be more glum, sober and serious. This seems to have some similarity with Cattell's (15) findings in that leading researchers in physics, physiology and biology were more desurgent, that is more sober and serious, than were people who were successful as executives in academic administrative positions. This does not match what Hinman (20) found with regard to innovative principals. She found that innovative principals were high in factor F, that is, they tended to be enthusiastic and happy-go-lucky.

Hemphill (19) suggests that if you want elementary principals who are proficient at maintaining organizational relationships, then you should seek those who are high on F, that is those who are enthusiastic and happy-go-lucky. On the other hand, his research suggests that if you desire a principal whose forte would be responding to outsiders, that is a principal who would listen to and serve the patrons of the district, then you would look for one who is F-, one who lacked enthusiasm.

It seems reasonable that factor H should appear as a significant contributor to the total personality of those who practice innovation. When you look at Cattell's explanation, he suggests that the H+ person shows "little inhibition by environmental threat, and incidentally, is rated lazy in childhood." "This constitutional insusceptibility to inhibition, in turn, generates the social, sexual, emotional and general readiness to venture observed in behavior ratings." He adds also that they are insusceptible to fatigue and punishment. Meeland, reported in Cattell (15), suggests that factor H was one of the most highly inherited personality factors. Counts in group situations, shows H+ persons feel free to participate, receive more than the average share of votes as an ineffective speaker and make more social-emotional, that is friendly, than task oriented remarks. They also have a history of being more frequently involved in organized clubs or teams. Cattell (15) found H+ people among those who were effective administrators in academic positions. Hinman (20), in her study of innovative principals, found H+ to be a significant factor. These are the thick-skinned, adventurous, active people who demonstrate a general dynamic figure and spontaneity. Hemphill (19) says if you are looking for a principal who is proficient in maintaining organizational relationships, he should be high in factor H.

Cattell (15) suggests that factor I people have a liking for travel and new experiences, a labile, imaginative, aesthetic mind, a love of dramatics and a certain impracticality in general affairs. There are indications that artists score higher on this factor and also that it is susceptible to culture pattern differences because Cattell (15) found that the initial European norms ran higher than in the U.S.A. Again, Cattell (15) found factor I people among those who were creative researchers and successful administrators.

It is interesting to note that factor N, to whatever degree it correlates significantly with educational practice, correlates negatively, that is, those who score low on factor N are apt to score high on the innovative practice scale. N+ people tend to be sophisticated and polished. Cattell (15) suggests that they are "ingenious, good at clinical diagnosis, flexible in viewpoint, alert to manners, to social obligations and to the social reactions of others." At first glance it would seem that these would be important for the innovator, on the other hand, if you look at the work of Hadley, as reported by Cattell (15), you find that N correlated negatively with teaching success. He suggests there being too much efficiency in N+ people to tolerate other people and their failings, and perhaps that there is more natural warmth and liking for people in N-.

The fact that Q_3 appeared among those significantly contributing to the differences in the practice score seems logical

when you look at Cattell's (15) description which says that Q_3 people show "socially approved character responses, self-control, resistance, foresight, consideration of others and conscientiousness." He further sees them as people who are more effective rather than merely popular. They make more remarks than others especially problem raising and solution offering, receive fewer votes as hinderers and fewer rejections at the end of the sessions. He adds that they are productive in organizational activities and it is high in executives, policemen, electricians and psychatric technicans. He also found it high in successful administrators. In constructing what is expected of a person who is going to implement innovative practices in education, this characteristic seems to fit in logically.

On the composite innovation score which includes the practice score just discussed as well as belief in educational change and belief in life change, we again find a multiple correlation of .52 which means that we can account for 27 percent of the variability in this composite innovation score by the 16 personality factors. Here again, through an examination of the part correlations, we find that six factors contribute significantly to the differences in this composite score. Three of the six, F- (sober, happy-go-lucky), H (shy, venturesome), and I (tough-minded, tender-minded) are the same as three of the factors found to correlate significantly with the practice score. We did not find, however, that B (less intelligent, more intelligent), E (humble, assertive), N- (forthright, shrewd), and Q_3 (undisciplined self-conflict, controlled) correlated with this composite score. This apparent difference in factors can be partially contributed to what is measured. We would like to point out that the practice score is a very important score, because it deals with that which the superintendent has actually done. Belief, however, is a hard matter to analyze, because there can be many misunderstandings about what we mean by belief about a given change and therefore, the composite score is probably not a very precise measure.

Notice, however, the characteristics that correlated here that did not appear with the practice score. For example, C- (affected by feelings, emotionally stable) was a significant factor, which means to the degree that this correlated with the composite score, it correlated negatively. That is, those who scored low on factor C are more apt to have a high composite score. It is difficult to explain why this correlates negatively because it seems incongruient with other findings. Cattell (15) suggests that the C- person is "easily annoyed by things and people, is dissatisfied with the world situation, his family, restrictions of life and his own health. He shows generalized neurotic responses in the form of phobias, psychosomatic disturbances, sleep disturbances, hysterical and obsessional behavior." And he further suggests that C+ individuals are far more frequently leaders than C- individuals. As a matter of fact,

he found that C+ was predominant among the eminent researchers and those holding academic administrative positions. In light of this comparison, it seems that careful consideration should be given before using factor C- and perhaps further study should be made of this specific factor.

Factor L correlated in a positive manner suggesting that a high score in factor L goes along with a high composite innovation score. This too, is somewhat incongruent in that Cattell (15) suggests that creative researchers tend to be lower in factor L (trusting, suspicious). The L- person tends to be "easy going, friendly, and perhaps some lack of ambition and striving." On the other hand, the L+ person is contemptuous of the average, is scrupulously correct in behavior, is annoyed by people putting on superior airs, and is skeptical of alleged idealistic motives in others. Just as in factor C-, we suggest that L be considered carefully because of an apparent incongruency with the findings of other studies.

Factor Q_4 (relaxed, tense) seems to appear many places and seems to be an extremely important one. Here again, we found that factor Q_4, to the degree that it correlates at all with the composite innovation score, correlates in a negative manner. That is, people who are more relaxed, are apt to score higher on the composite innovation score. Cattell (15) suggests that persons high in Q_4 rarely achieve leadership and that they take a poor view of the degree of group unity, orderliness and the existing leadership quality, and receive a few sociometric votes. Hemphill (19) in his study of elementary principals, found that those who are willing to exchange information and those who are ready to discuss problems with other administrators before taking action also fall in the Q_4- category. That is, they tend to be more relaxed. It is interesting to note too, that Q_4- is predominant among creative researchers. Drevdahl (16) also found Q_4- to be predominant among creative artists.

Our next concern is with hypotheses 2 and 3 which dealt with differences in two different groups regarding the 16 personality factors. When we discovered that the Idaho superintendents did not deviate from the average adult population and that the Idaho superintendents dominated the lower half of a distribution along a continuum from high innovative to low innovative and, further, that the S. D. C. group had a mean profile that sharply deviated from the average adult population and that they dominated the high end of the scale on innovation, we felt that it was important to see if personality differences existed between the Idaho group and the S. D. C. group.

We concluded that there was a difference after finding significant differences in the following ten factors: B (less intelligent, more intelligent), C (affected by feelings, emotionally

stable), E (humble, assertive), H (shy, venturesome), L (trusting, suspicious), M (practical, imaginative), O (placid, apprehensive), Q_1 (conservative, experimenting), Q_3 (undisciplined self-conflict, controlled), Q_4 (relaxed, tense). Five of these ten were significant at the .001 level and one was significant at the .01 level. Examination of the direction of these differences reveals that the S. D. C. national group is more intelligent, more emotionally stable, more humble, more venturesome, more trusting, more imaginative, more placid, more experimenting, more controlled and more relaxed than the Idaho group.

In a preceding discussion, we considered factors B (less intelligent, more intelligent), C (affected by feelings, emotionally stable), E (humble, assertive), H (shy, venturesome), L (trusting, suspicious), Q_3 (undisciplined self-conflict, controlled), and Q_4 (relaxed, tense). We have not, however, examined the meaning of M (practical, imaginative), O (placid, apprehensive), and Q_1 (conservative, experimenting). If the national (S.D.C. group) is actually a more innovative group, the fact that they score higher on Q_1 seems logical, because Cattell (15) suggests that Q_1 people are "more well informed, more inclined to experiment with problems solutions, less inclined to moralize." Additionally, they expressed more interest in science than religion, more interest in analytical thought than modern essays, in reading as opposed to class instruction, in breaking the crust of custom and tradition and in leading and persuading people. It seems to me that this is an expected and important difference. Because of the conservative rural nature of the people in Idaho and because of low financial resources for education, it seems logical that educational leadership positions would be filled by people who have a lesser tendency to "break the crust of custom" and less inclined to "experiment with problem solutions." The opposite would be true in educational enterprises that were interested in change in education.

Likewise, it is logical that the people who score lower on factor O (placid, apprehensive) would be found among those interested in innovation in education. The people who score higher on factor O, the O+ people, are found to be more placid rather than apprehensive and Cattell (15) suggests that the high O factor is strongly weighted against successful leadership in face to face situations and is correlated significantly with accident proneness in automobile driving, and this certainly does not describe the kind of person who probably would be innovating in education. He further adds that O+ people prefer books and quiet interests to people and noise and that they feel inadequate to meet the rough daily demands in life. It is important to remember, then, that the superintendents who were interested in and implementors of innovation were found to be on the minus side of this characteristic, that is, they were cheerful and resilient and tough and expedient

and vigorous and would tend to show interest in people. It likewise seems logical that Hemphill (19) should find in his study of elementary principals that those who are willing to exchange information as an administrative performance also scored low on this factor O.

Factor M, typically described as the practical versus imaginative, is found to exist to a great degree among the creative researchers and artists. Drevdahl (16) suggests that the creative researcher and artist can be distinguished from administrators and teachers of the same eminence by the use of factor M+. It is interesting to note that it also distinguishes top level advertising planners from routine salesmen in the field.

Hypothesis number 3 was tested by using 164 subjects, that is, all of the Idaho superintendents as well as the national (S.D.C.) group. We selected as the high innovators, all superintendents from this group who scored more than one standard deviation above the mean and we placed in the low innovative group all of those who scored more than minus one standard deviation from the mean. This, then, provided two distinct groups for which we could make comparisons on the 16 personality factors.

We found that there were six factors which differed significantly. These factors are: A (reserved, outgoing), E (humble, assertive), H (shy, venturesome), M (practical, imaginative), Q_1 (conservative, experimenting), and Q_4 (relaxed, tense). We, therefore, concluded that the personality characteristics of innovative superintendents does differ from the personality characteristics of non-innovative superintendents. Again, looking at the direction of these differences, we find that the innovative superintendents were more outgoing, more assertive, more venturesome, more imaginative, more experimenting and more relaxed than the low innovative group. This seems to fit the pattern that Bos (6) found in seeking the expectation that educators had for implementors of change. He suggested that they should be emotionally stable, adaptable, experimenting and enthusiastic.

Note also that five of these six are the same characteristics that distinguished the Idaho superintendents from the S.D.C. group. The only factor that did not appear in the Idaho versus the S.D.C. group and the correlation study was factor A. Factor A is used to describe the continuum from reserved to outgoing and if one examines the direction of this, he finds that the innovative superintendents tend to be more outgoing. This again tends to be a logical personality characteristics to be found in the innovators of education because Cattell (15) suggests A+ individuals express marked preference for occupations dealing with people, enjoy social recognition and are generally willing to go along with expediency. He further adds that there is evidence that A+ persons

more readily form active groups and there is experimental proof that they are more generous in personality relationships, less afraid of criticism, better able to remember names of people, but probably less dependable in precision work and exactly meeting obligations. Teachers and salesmen are frequently found in this group.

Hypothesis numbers 4, 5, and 6 dealt with the association between age and willingness to accept change, number of years in a position and willingness to accept change, and size of the superintendents' school and willingness to accept change. On a chi-square test of independence, we concluded that there is no association between age and willingness to accept change and no association between mean years in a position and willingness to accept change. We did find, however, that there was a relationship between number of teachers employed and willingness to accept change. This seems to fit the pattern that Reynolds (25a) found when he suggests that superintendents from large school districts were more innovative than those from small school districts. Our findings did not agree with Rogers as reported by Carlson (12) where he found that innovators are generally young. That is, we found that there was no association between age and willingness to accept change.

A summary of our conclusions then, would be that there is a correlation between personality characteristics and acceptance of change in education, and further, there is a distinct difference between the personality characteristics of those who are willing to accept change and those who are unwilling to accept change. This, then, should certainly lead us to a further exploration and refinement of personality characteristics as a means of predicting public school superintendents who would be willing to implement change in education.

RECOMMENDATIONS

On the basis of the data from this study and the conclusions reached from the statistical treatment of the data, we make the following recommendations:

1. The study should be repeated in order to determine the amount of shrinkage on the correlations between the 16 personality factors and the innovation scales and to determine whether the same personality characteristics continue to show up differently for innovators and non innovators. If the study is repeated, however, we recommend that the innovation scale be refined. We also recommend the removal of the life belief items because we found their correlation to be very low with the education belief score. We feel, however, that the education belief score and the education practice score are certainly useable as a means of determining a level of acceptance of innovative practices in education. If possible, the practice score should be weighted more heavily than the belief score and the items in the innovation scale should be updated.

2. We feel that the correlation of .52 and consequently the ability to predict 27 percent of the differences in the composite innovation score indicates what personality factors might be a useful item in predicting administrators who would be innovative. We are thus suggesting that a prediction equation be developed on the basis of the personality factors that contribute significantly. This type of a prediction equation would be useful for admitting people to training programs and for selecting people to fill positions as change agents in school districts who desire people who readily accept change and implement innovation in education.

3. Even though the 16 P. F. has many advantages as a research tool, it is long and sometimes threatening to the subject. We suggest, therefore, that a search be made for other instruments that correlate highly with the significant personality factors in the 16 P. F. and that may be shorter and less threatening.

4. There may be other means of assessing a candidate and thus predicting his willingness to innovate. On the assumption that environment is an important variable in establishing personality patterns it may be possible to correlate personality characteristics and items about a persons life. If high correlations are found between life history items and the significant personality characteristics, then the life history items could be used as predictors of willingness to accept and implement innovations in education. Albright, Glennon and Owens (2) published a catalogue of life history items including categories on recreation, hobbies and interests, as well as

many life, health and education items. This may be a useful source of items to be correlated with personality characteristics. Securing these items about a persons life may be less threatening than asking a candidate to respond to a personality questionnaire.

5. After more research, it may be possible to select those questions that determine the significant personality traits and thus develop a shorter test to be used as an instrument to select innovative people.

6. The results of this research have implications for administrative training programs. If there are school districts in the United States who want innovative superintendents, then it becomes the responsibility of training institutions to provide these kinds of people. Therefore, we must capitalize on this research, attempt to predict those who will be innovators in education and develop training programs that capitalize on these traits. There is reason to believe, for example, that the situation in which the administrator finds himself, may also be a factor in whether implementation takes place. The factor of financial resources certainly might make a difference. It therefore, becomes important that the training institution select people with the right characteristics, provide a training program that teaches them how to organize for change; provide a training program that teaches them to secure the best possible resources and thus produce a candidate who is in the best position to cause change in education.

SUMMARY

The purpose of this research was to determine whether a correlation exists between personality characteristics of school superintendents and their willingness to accept and implement innovations in education. The research also tested for differences in personality factors between high innovative and low innovative superintendents. Three variables, age of superintendent, mean length of time in position and size of school district were tested for associations with degree of innovativeness. Specifically, the following hypotheses were tested:

1. Personality characteristics of superintendents as measured by the 16 P. F. are not significantly correlated with the superintendents' willingness to accept change as measured by their responses to innovation scales.

2. The 16 P. F. scores of superintendents as described as being interested in and implementors of innovation by the Systems Development Corporation Study will not differ significantly from the 16 P. F. scores of Idaho superintendents.

3. The 16 P. F. scores of all superintendents in this study scoring + 1 standard deviation or more on composite innovation scores will not differ significantly from the 16 P. F. scores of superintendents in both groups scoring - 1 standard deviation or more on composite innovation scores.

4. The age of superintendents is not significantly associated with their willingness to accept change as measured by innovation scales.

5. The mean number of years superintendents remain in a position is not significantly associated with their willingness to accept change as measured by innovation scales.

6. The size of the school district is not significantly associated with the superintendents willingness to accept change as measured by innovation scales.

Data were gathered from 93 Idaho superintendents and 71 superintendents from 12 states who had been identified by a Systems Development Corporation Study as interested in and implementors of innovations in education.

The 164 superintendents were administered parts A and B of Cattell's 16 Personality Factor Questionnaire to determine their personality traits. Additionally, a three part scale on acceptance of and implementation of innovation was administered to determine a composite innovation score.

Multiple correlations and part correlations were computed between personality factors and acceptance of innovations. An analysis of variance technique with the F-ratio was used to test for difference in personality between high innovative and low innovative superintendents. A chi-square was computed to test the relationship between degree of innovativeness and the descriptive variables.

A significant multiple correlation of .52 was found between the 16 personality factors and the composite innovation score. Six specific personality factors (C, F, H, I, L and Q_4) made a significant contribution to the differences in the composite score.

A significant multiple correlation of .52 was also found between the 16 personality factors and the educational innovation practice score with factors B, E, F, H, I, N and Q_3 making a significant contribution to the differences in the practice score.

We found also that high innovative and low innovative superintendents differ significantly on 6 personality factors; A, E, H, M, Q_1 and Q_4. Additionally, the tests showed that Idaho superintendents differed from the national (S.D.C.) group on 10 personality factors; B, C, E, H, L, M, O, Q_1, Q_3, and Q_4.

The chi-square test of independence found no association between age and degree of innovativeness and mean number of years and degree of innovativeness. Our study, however, did find a relationship between size of district and degree of innovativeness.

The conclusions were:

1. There is a significant correlation between personality characteristics of superintendents and their willingness to accept and implement change in education.

2. There is a difference in the personality characteristics of the Idaho superintendents and the national (S.D.C.) group. The national group is significantly more intelligent, more emotionally stable, more humble, more venturesome, more trusting, more imaginative, more placid, more experimenting, more controlled and more relaxed than the Idaho group.

3. There is a difference in the personality characteristics of the high innovative superintendents and the low innovative superintendents. The high innovative superintendents are significantly more outgoing, more assertive, more venturesome, more imaginative, more experimenting and more relaxed than the low innovative superintendents.

4. There is no relationship between age of superintendent or mean years in a position and degree of innovativeness, but there is a relationship between size of school district and degree of innovativeness.

On the basis of these conclusions, the following recommendations were made:

1. Repeat the study, with refined and updated innovation scales, to check for shrinkage on correlations and to verify differences.

2. On the basis of the data and findings, work should be done to develop an equation for identifying and predicting innovative administrators.

3. Search for other, simpler, less threatening instruments that correlate with the 16 P. F. or prepare a shorter test for identifying innovative people by using only the questions that refer to the significant personality factors.

4. Work toward correlating life history items with the 16 personality factors as a less threatening manner of selecting innovative administrators.

5. Use the results to assist in the selection of potential innovative administrators and perfect training programs that enhance the personality traits.

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APPENDIX A

Innovation Scales

Development

Development of the innovation scales was carried out during the fall of 1965 at Utah State University.

The life and education attitude scales were developed to include new concepts and innovations in both life and education after careful search of current literature and actual practice. The original education innovation attitude scale contained 131 educational items in six categories. These categories included staff, students, technology, curriculum, time utilization, and facilities or places. In the life situation attitude innovation scale, 131 items and ten categories emerged. The ten categories were: Household appliances, hobbies, gadgets, automotive, household furnishings, science, music and art, personal items, new foods, and building and construction.

The education and life innovation attitude scales with 131 items each were administered to a group of 15 Utah State University educational administration graduate students and staff members using a five category Liker-type scale to determine the innovativeness of the items on each scale. The two scales, life items and education items, were then each reduced to the 75 most innovative items.

The next step in the reduction of the life and educational innovation attitude scales was to administer the instruments of 75 items each to Utah school superintendents to determine their attitudes toward life and education innovations. Those items on each scale showing the least amount of variability were discarded to reduce the length of each scale to 31 items.

An innovation behavior verification scale was then developed from the education attitude scale items. The innovation behavior verification scale allowed the superintendents to indicate the extent to which 31 selected education innovations had been considered or implemented in their school districts.

The composite battery consisting of the two innovation attitude scales and the education innovation behavior verification scale were then re-administered to a group of twelve educational administration staff members and graduate students to run a final pilot study chec

Reliability

The reliability coefficient was calculated for the life and education attitude scales using the split-half method as reported by Garrett (18a). Each of the scales were divided into two equivalent "halves" by taking "odd numbered" and "even numbered" items and the correlation found for these half-tests. From the reliability of the half test, the self correlation of the whole test was then estimated using the Spearman-Brown Prophecy formula.

The reliability coefficient for the education attitude scale was calculated to be .78 while the life scale was .56. According to Garrett (18a), these correlations of the scales with themselves seem to denote a substantial or marked reliability coefficient well above the realm of chance.

APPENDIX A

INNOVATION SCALES

Educational Belief Items

1. Open-Ended Curriculum (Students may enroll in any class at any grade 5-12 depending on ability)
2. Elementary and Secondary Education Act of 1965 P.L. 89-10 Title IV (Research)
3. Ungraded Junior and Senior High Schools
4. Continuous progress program (no traditional grade levels)
5. Electronic study carrells (Equipped for viewing film strips and listening to tapes)
6. Teaching "Pods" (3 or 4 classrooms in 1 large open facility)
7. Night Science, Philosophy, etc. seminars for H. S. Students
8. Non-Graded Elementary School (Groups children for instruction according to criteria other than age)
9. Team Administration of Schools
10. Classroom carpeting
11. Carrying out pilot programs in new areas of education
12. Modular Scheduling (Ex. A school day of 20 minute modular time intervals consisting of 21 modules per day)
13. Individual scheduling (each student has a program designed according to his needs, interests and ability)
14. Automated data processing for attendance purchasing, and permanent records, class scheduling
15. Financial incentives to encourage long range staff improvement (payment for summer schools, workshops, etc.)
16. Sabbatical leave for professional staff

17. Windowless Classrooms

18. School Library Carpeting

19. Operable Walls (Flexible folding type, may be moved by motor or hand power)

20. Modern Science Courses (PSSC physics, CBA chemistry, BSCS Biology)

21. Team Teaching

22. Modern Mathematics (SMSG, Greater Cleveland, etc.)

23. Rear View Movie projection

24. Psychiatric or psychologist services for students

25. Shared Instruction (Neighboring schools share either teachers or facilities for their mutual benefit)

26. Programmed Instruction (Grammer, Math, Spelling, Science, Textbooks, etc.)

27. Writing of "Master Plans" for school districts (To aid in long range planning and improvement of school systems)

28. Group counseling for students

29. Fluid groups (Students move from group to group as needed)

30. Elementary Science Laboratory for use of Grade School Children

31. Block Scheduling (Double class periods or longer scheduled for certain classes)

Life Belief Items

1. Heart Transplants
2. Food Preserved by Atomic Radiation
3. Infra red cooking (Cooks hamburgers in 10 seconds, etc.)
4. Car steered by Automatic electric eye
5. Photography of Mars
6. Air Cusion Lawn Mower (Mower skids along on a ½ inch cushion of air above the ground. It stands the grass on end so it can be cut by the rotary mower blade.)
7. Communications satelite (telstar)
8. Landing a man on the moon
9. Vasual telephones (Can see the person communicating with)
10. Miniture transistorized T.V.
11. Automatic automobile light dimmer
12. Poleroid Cameras (10 second developing of film)
13. Telephone Amplifier (all in the room can hear and respond to telephone conversation)
14. Fast Load Cameras (Uses a plastic cartridge that is dropped into the back of the camera)
15. Jet Propelled Boats (Boats propelled by a jet of water)
16. Mental Illness Outpatient Care
17. Automatic light sensitive systems (Turns on and off automatically)
18. Automatic speed control devices on cars
19. Clock with calendar window on its dial set to time the fertility cycle for women using method of birth control
20. Push button telephone dialing

21. Birth Control Pills

22. Dual braking systems for automobiles (In case of failure of one system)

23. Frozen dry foods

24. Telephone conference hook-up

25. Zip Code

26. Electric wrist watches (Operated on a single battery for one year)

27. Color Television

28. Flu prevention shots

29. Tranquilizers

30. Recharagable flashlights

31. Remote control grage doors (Door opens by pushing a button in the automobile)

Behavior Verification Scale

WHAT TO DO: On each item below, please check the statement that most nearly represents your experience. In the space provided, please write the name of the individual in your school district directly responsible for the project. The name of the individual responsible for the project is needed if further information concerning the educational improvement is necessary to complete this study.

1. Open-Ended Curriculum (Students may enroll in any class at any grade 5-12 depending upon their ability)

_____ (A) Has been adopted throughout the district
_____ (B) Has been tried in one school
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the principal or curriculum supervisor responsible for the curriculum project

2. Elementary and Secondary Education Act of 1965 P.L. 89-10 Title III (Projects to Advance Creativity in Education)

_____ (A) A proposal has been written and submitted to the State Department of Education
_____ (B) A proposal is in the process of being prepared
_____ (C) A proposal will probably be written at a later date when more information is available
_____ (D) A proposal has not been considered

_____
Name of the individual responsible for writing the proposal

3. Electronic Study Carrells (Equipped for viewing film strips and/or listening to tapes)

_____ (A) Have been provided for Secondary School Students
_____ (B) A few have been purchased to test their value
_____ (C) Have been considered by the administration and staff
_____ (D) Have not been considered

_____
Name of the individaul responsible for initiating the project

4. School District Funds Budgeted for Research within the District

_____ (A) Have been provided for all personnel who desire to carry out research projects
_____ (B) Have been provided on a limited basis to carry out some research projects
_____ (C) Have been considered by the administration and staff
_____ (D) Have not been considered

_____
Name of the individual responsible for research and the approximate percent of the total expenditures budgeted for research during 1965-66

5. Teaching Pods (Three or four classrooms in one large open facility)

_____ (A) Has been tried in all schools having suitable facilities in the district
_____ (B) Has been tried on a limited basis for testing its value
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the individual responsible for the project being tried or considered

6. Tele-Lecture (Two-way amplified telephone calls let guest lectures speak and students respond great distances apart)

_____ (A) Has been provided for all classrooms desiring this service
_____ (B) Has been provided on a limited basis for testing its value
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the individaul responsible for coordinating the project

7. Night or Saturday Seminars for High School Students (Science, Philosophy, etc.)

_____ (A) Have been provided in one or more areas for high school students
_____ (B) Have been provided for one class to determine its value
_____ (C) Have been considered by the administration and staff
_____ (D) Have not been considered

_____
Name of the individual instructing or proposed to instruct the class

8. Non-Graded Elementary School (Children are grouped for instruction according to criteria other than age)

_____ (A) Has been tried in all of the grade schools of the district
_____ (B) Has been tried in one grade school
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the principal or supervisor responsible for directing the project

9. Operation Head Start (Kindergarten programs for culturally deprived children)

_____ (A) Is in operation in our school district
_____ (B) A proposal has been submitted so that a program can be put into operation
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the person directing or proposed to direct the program

10. Classroom Carpeting

_____ (A) Has been installed throughout the district's classrooms
_____ (B) Has been installed in one or more areas for testing its value
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the individual responsible for initiating the project

11. Carrying out Pilot Programs in New Areas of Education

_____ (A) Several pilot programs are being carried out in our district
_____ (B) One pilot program is being carried out in our district
_____ (C) A pilot program in a new area of education is being considered by the administration and staff
_____ (D) No pilot program is being considered at this time

_____
Name of the pilot program and person responsible for directing the program

12. Modular Scheduling (Example: A school day of 20 minute modular time intervals consisting of 21 modules per day)

_____ (A) Has been adopted throughout the district
_____ (B) Has been tried to test its value
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the principal or supervisor responsible for the project

13. Individual Scheduling (Each student has a program designed according to his needs, interests and ability)

_____ (A) Has been adopted throughout the schools in the district on the secondary level
_____ (B) Has been tried in one secondary school
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the principal or counselor directly responsible for the project

14. Educational Television

_____ (A) Is being utilized by all classrooms in the district when applicable
_____ (B) Is being utilized on a limited basis
_____ (C) Is being considered by the administration and staff
_____ (D) Is not being considered

_____
Director or Coordinator of the Educational Television programming

15. Financial Incentives to Encourage Long Rang Staff Improvement (Payment for summer school, workshops, or other professional improvement activities)

_____ (A) Has been adopted as part of the school board policy and made available for all personnel
_____ (B) Has been adopted by the school board for personnel in key positions only
_____ (C) Has been considered by the school board and administration
_____ (D) Has not been considered

_____
Name of the clerk or business agent or individual in the district responsible for payment of financial incentives

16. Sabbatical Leave (For professional improvement of staff members)

_____ (A) Has been adopted by the school board for all professional personnel

_____ (B) Has been adopted by the school board for personnel in key positions only

_____ (C) Has been considered by the school board and administration

_____ (D) Has not been considered

_____

Name of the individual who administers the sabbatical leave program

17. Windowless Classrooms

_____ (A) Classrooms are being or have been built without windows in the district

_____ (B) Future classrooms built in the district will be windowless

_____ (C) Windowless classrooms are being considered for future classroom building by the administration and staff

_____ (D) Windowless classrooms are not being considered

_____

Name of the building contractor or architect involved in the project

18. School Library Carpeting

_____ (A) Has been installed in most of the district's libraries

_____ (B) Has been installed in one of the district's school libraries for testing

_____ (C) Has been considered by the administration and staff

_____ (D) Has not been considered

_____

Name of the individual responsible for initiating the project

19. Operable walls (Flexible folding type, may be moved by motor or by hand)

_____ (A) Have been installed in several areas in the district
_____ (B) Have been installed in one area for testing
_____ (C) Have been considered by the administration and staff
_____ (D) Have not been considered

_____
Name of the individual responsible for initiating the project to install operable walls or the individual supervising areas of use

20. Modern Science Instruction (PSSC Physics, CBA Chemistry, BSCS Biology, Etc.)

_____ (A) Has been adopted throughout the district in appropriate areas
_____ (B) Has been tried in one science field in the district
_____ (C) Has been considered by the administration and science department
_____ (D) Has not been considered

_____
Name of the individual responsible for supervising the project

21. Teacher Aids (Clerical or Instructional)

_____ (A) Have been employed in several areas of instruction to aid teachers
_____ (B) Have been employed on a limited basis for evaluation of the practice
_____ (C) Have been considered by the administration and staff
_____ (D) Have not been considered

_____
Number of Teachers Aids Hired for 1965-66 and/or supervisor of the project

22. Team Teaching

_____ (A) Has been adopted in all schools having suitable facilities in the district
_____ (B) Has been tried on a limited basis for testing its value
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the individual supervising the project

23. Modern Mathematics (SMSG, Greater Cleveland, Etc.)

_____ (A) Has been adopted throughout the district at all grade levels
_____ (B) Has been introduced in a few grades
_____ (C) Has been considered by the administration and mathematics department
_____ (D) Has not been considered

_____
Name of the individual responsible for supervising the project

24. Rear View Movie Projection

_____ (A) A few units have been purchased for use in the district
_____ (B) One unit has been purchased for testing its value
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the individual responsible for Audio-Visual Equipment

25. Psychiatric or Psychologist Services for Students

_____ (A) Have been contracted or arranged for as needed
_____ (B) Are made available in only extreme cases of need
_____ (C) Have been considered by the administration and staff
_____ (D) Have not been considered

_____
Name of the individual responsible for this area

26. Shared Instruction (Neighboring school districts share either teachers or facilities for their mutual benefit)

_____ (A) Has been cooperatively established with another school district
_____ (B) Has been discussed with a neighboring district but not yet established
_____ (C) Has been considered in our district by the administration and school board
_____ (D) Has not been considered in our district

_____
Name of the neighboring district cooperating or attempting cooperation

27. Programmed Instruction (Grammar, Mathematics, Science, Spelling, Etc.)

_____ (A) Is being used in all classrooms in the district where applicable
_____ (B) Is being experimented with in a few grades or subject areas
_____ (C) Has been considered by the administration and staff
_____ (D) Has not been considered

_____
Name of the individual responsible for the project

28. Writing of "Master Plans" for School District (To aid in long range planning and improvement of school systems)

_____ (A) Has been carried out in the school district
_____ (B) Has been discussed with a professional consulting service but not yet contracted
_____ (C) Has been considered by the school board and administration
_____ (D) Has not been considered

_____
Name of the organization completing or contemplating Master Planning Services

29. Elementary Science Laboratory for use of Grade School Children

_____ (A) A grade school is being or has been provided with a science facility
_____ (B) Future grade schools built in the district will have this facility
_____ (C) Has been considered by the administration and elementary staff
_____ (D) Has not been considered

_____
Name of the principal or supervisor responsible for this area

30. Teaching Controversial Issues (Evolution, Religion, Etc.)

_____ (A) All teachers are encouraged to teach controversial issues
_____ (B) Teachers are free to teach controversial issues
_____ (C) Teachers are discouraged from teaching controversial issues
_____ (D) Teachers are not permitted to teach controversial issues

_____
Number of teachers teaching controversial issues in the district

31. Block Scheduling (Classes are scheduled for double periods or longer in some subject matter areas)

_____ (A) Has been adopted in several subject matter areas and grade levels

_____ (B) Has been adopted in limited subject matter areas and grade levels

_____ (C) Has been considered by the administration and staff

_____ (D) Has not been considered

_____

Principal or Supervisor responsible for scheduling

APPENDIX B

BIPOLAR DESCRIPTIONS OF SOURCE TRAITS

FOR 16 PERSONALITY FACTORS

Factor A

WARM, SOCIABLE	vs.	ALOOF, STIFF
Good Natured, Easy Going	vs.	Agressive, Grasping, Critical
Ready to Co-operate	vs.	Obstructive
Attentive to People	vs.	Cool, Aloof
Soft Hearted, Kindly	vs.	Hard, Precise
Trustful	vs.	Suspicious
Adaptable	vs.	Rigid
Warm Hearted	vs.	Cold

Factor B

BRIGHT	vs.	DULL
Conscientious	vs.	Of Lower Morale
Persevering	vs.	Quitting
Intellectual, Cultured	vs.	Boorish

Factor C

MATURE, CALM	vs.	EMOTIONAL, IMMATURE, UNSTABLE
Emotionally Mature	vs.	Lacking in Frustration Teolerance
Emotionally Stable	vs.	Changeable (in attitudes)
Calm, Phlegmatic	vs.	Showing General Emotionality
Realistic about Life	vs.	Evasive (on awkward issues and in facing personal decisions)
Absence of Neurotic Fatigue	vs.	Neurotically Fatigued
Placid	vs.	Worrying

Factor E

AGRESSIVE, COMPETITIVE	vs.	"MILK-TOAST", MILD
Assertive, Self-Assured	vs.	Submissive
Independent Minded	vs.	Dependent
Hard, Stern	vs.	Kindly, Soft-Hearted
Solemn	vs.	Expressive
Unconventional	vs.	Conventional
Tough	vs.	Easily Upset
Attention Getting	vs.	Self-Sufficient

Factor F

ENTHUSIASTIC, HAPPY-GO-LUCKY	vs.	GLUM, SOBER, SERIOUS
Talkative	vs.	Silent, Imtrospective
Cheerful	vs.	Depressed
Serene, Happy-go-lucky	vs.	Concerned, Brooding
Frank, Expressive	vs.	Incommunicative, Smug
Quick and Alert	vs.	Languid, Slow

Factor G

CONSCIENTIOUS, PRESISENT	vs.	CASUAL, UNDEPENDABLE
Persevering, Determined	vs.	Quitting, Fickle
Responsible	vs.	Frivolous
Emotionally Mature	vs.	Demanding, Impatient
Consistently Ordered	vs.	Relaxed, Indolent
Conscientious	vs.	Undependable
Attentive to People	vs.	Obstructive

Factor H

ADVENTUROUS, "THICK-SKINNED"	vs.	SHY, TIMID
Adventurous, Likes meeting people	vs.	Shy, Withdrawn
Active, Overt Interest in Opposite sex	vs.	Retiring in Face of Opposite Sex
Responsive, Genial	vs.	Aloof, Cold, Self-Contained
Friendly	vs.	Apt to Be Embittered
Impulsive and Frivolous	vs.	Restrained, Conscientious
Emotional and Artistic Interests	vs.	Restricted Interests
Carefree, Does not See Danger Signals	vs.	Careful, Considerate, Quick to See Dangers

Factor I

SENSITIVE, EFFEMINATE	vs.	TOUGH, REALISTIC
Demanding, Impatient, Subjective	vs.	Realistic, Expects Little
Dependent, Seeking Help	vs.	Self-reliant, Taking Responsibility
Kindly, Gentle	vs.	Hard (to point of synicism)
Artistically Fastidious, Affected	vs.	Few Artistic Responses (but not lacking taste)
Imaginative in Inner Life and in Conversation	vs.	Unaffected by "Francies"
Acts on Sensitive Intuition	vs.	Acts on Practical, Logical Evidence
Attention Seeking, Frivolous	vs.	Self-sufficient
Hypochondriacal, Anxious	vs.	Unaware of Physical Disabilities

Factor L

SUSPECTING, JEALOUS	vs.	ACCEPTING, ADAPTABLE
Jealous	vs.	Accepting
Self-sufficient	vs.	Outgoing
Suspicious	vs.	Trustful
Withdrawn, Brooding	vs.	Open, Ready to Take a Chance
Tyrannical	vs.	Understanding and Permissive, Tolerant
Hard	vs.	Soft-hearted
Irritable	vs.	Composed and Cheerful

Factor M

BOHEMIAN INTROVERTED, ABSENT-MINDED	vs.	PRACTICAL, CONCERNED WITH FACTS
Unconventional, Self-absorbed	vs.	Conventional Alert to Practical Needs
Interested in Art, Theory, Basic Beliefs	vs.	Interests Narrowed to Immediate Issues
Imaginative, Creative	vs.	No Spontaneous Creativity
Frivolous, Immature in Practical Judgment	vs.	Sound, Realistic, Dependable, Practical Judgment
Generally Cheerful, But Occasional Hysterical Swing of "Giving Up"	vs.	Earnest, Concerned or Worried, but Very Steady

Factor N

SOPHISTICATED, POLISHED	vs.	SIMPLE, UNPRETENTIOUS
Polished, Socially Alert	vs.	Socially Clumsy and "Natural"
Exact, Calculating Mind	vs.	Vague and Sentimental Mind
Aloof, Emotionally Disciplined	vs.	Warm, Gregarious, Spontaneous
Esthetically Fastidious	vs.	Simple Tastes
Insightful Regarding Self	vs.	Lacking Self Insight
Insightful Regarding Others	vs.	Unskilled in Analyzing Motives
Ambitious, Possibly Insecure	vs.	Content with What Comes
Expedient, "Cuts Corners"	vs.	Trusts in Accepted Values

Factor O

TIMID, INSECURE	vs.	CONFIDENT, SELF-SECURE
Worrying, Anxious	vs.	Self-Confident
Depressed	vs.	Cheerful, Resilient
Sensitive, Tender, Easily Upset	vs.	Tough, Placid
Strong Sense of Duty	vs.	Expedient
Exacting, Fussy	vs.	Does Not Care
Hypochondriacal	vs.	Rudely Vigorous
Phobic Symptoms	vs.	No Fears
Moody, Lonely, Brooding	vs.	Given to Simple Action

	Factor Q^1	
RADICALISM	vs.	CONSERVATISM OF TEMPERAMENT
	Factor Q^2	
SELF-SUFFICIENT, RESOURCEFUL	vs.	SOCIABLY GROUP DEPENDENT
	Factor Q^3	
CONTROLLED, EXACTING WILL POWER	vs.	UNCONTROLLED, LAX
	Factor Q^4	
TENSE, EXCITABLE	vs.	PHLEGMATIC, COMPOSED

Reliability of the Sixteen Personality Factor Questionnaire

The 16 P. F. is a personality test based on factor analysis which measures 16 factors or traits of the respondent's personality. Split-half reliabilities for each of the 16 factor scales range from .71 to .93, averaging about .84. Internal construct validities range from .73 to .96, averaging approximately .88. (Cattell (15).

APPENDIX C
Table 15

CORRELATION MATRIX - 16 PERSONALITY FACTORS, 3 INNOVATION SUB-SCORES, 1 COMPOSITE INNOVATIO

VARIABLE	CORRELATIONS A	B	C	E	F	G	H	I	L	M	N	O	Q
A	1.000	0.027	0.101	0.364	0.525	-0.211	0.431	0.391	-0.162	0.116	-0.064	-0.323	-0.
B	0.027	1.000	0.252	0.084	0.024	-0.161	0.215	0.206	-0.309	0.362	-0.075	-0.345	0.
C	0.101	0.252	1.000	-0.025	0.153	-0.022	0.504	-0.118	-0.500	0.156	0.019	-0.617	-0.
E	0.364	0.084	-0.025	1.000	0.488	-0.577	0.478	-0.049	0.267	0.191	-0.243	-0.137	0.
F	0.525	0.024	0.153	0.488	1.000	-0.194	0.571	-0.056	0.266	-0.013	-0.342	-0.336	-0.
G	-0.211	-0.161	-0.022	-0.577	-0.194	1.000	-0.045	0.074	0.019	-0.088	0.110	0.149	-0.
H	0.431	0.215	0.504	0.478	0.571	-0.045	1.000	-0.005	-0.156	0.213	-0.257	-0.542	0.
I	0.391	0.206	-0.118	-0.049	-0.056	0.074	-0.005	1.000	-0.304	0.466	-0.005	0.111	-0.
L	-0.162	-0.309	-0.500	0.267	0.266	0.019	-0.156	-0.304	1.000	-0.239	-0.227	0.421	-0.
M	0.116	0.362	0.156	0.191	-0.013	-0.088	0.213	0.466	-0.239	1.000	-0.052	-0.212	0.
N	-0.064	-0.075	0.019	-0.243	-0.342	0.110	-0.257	-0.005	-0.227	-0.052	1.000	-0.266	-0.
O	-0.323	-0.345	-0.617	-0.137	-0.336	0.149	-0.542	0.111	0.421	-0.212	-0.266	1.000	-0.
Q_1	-0.114	0.102	-0.043	0.405	-0.127	-0.437	0.115	-0.034	-0.012	0.319	-0.023	-0.027	1.
Q_2	-0.615	-0.041	-0.101	-0.182	-0.672	0.044	-0.413	-0.059	0.050	-0.077	0.032	0.465	0.
Q_3	-0.099	0.127	0.557	-0.380	-0.221	0.477	0.224	-0.044	-0.436	0.028	0.415	-0.411	-0.
Q_4	0.022	-0.261	-0.779	-0.036	0.043	0.109	-0.492	0.100	0.632	-0.201	-0.010	0.581	-0.
EDUC. BELIEF	0.192	0.103	0.103	0.208	0.085	-0.058	0.250	0.234	-0.029	0.278	0.021	-0.185	0.
LIFE BELIEF	0.173	0.137	0.086	0.107	0.088	-0.036	0.187	0.112	-0.086	0.215	0.005	-0.203	0.
EDUC. PRAC.	0.058	0.296	0.143	0.235	0.038	-0.061	0.328	0.178	-0.112	0.304	-0.149	-0.149	0.
ID. OR SDC GRP.	0.052	0.351	0.183	0.145	0.078	-0.026	0.313	0.169	-0.160	0.295	-0.179	-0.188	0.
COMP. INN. SCORE	0.184	0.233	0.144	0.239	0.092	-0.067	0.332	0.227	-0.098	0.346	-0.053	-0.233	0.

C
5
RES,

1 COMPOSITE INNOVATION SCORE AND SUPERINTENDENTS PLACEMENT IN IDAHO OR S.D.C. GROUP

	M	N	O	Q_1	Q_2	Q_3	Q_4	Educ. Belief	Life Belief	Educ. Prac.	Id. or S.D.C.	Comp. Inn. Score
162	0.116	-0.064	-0.323	-0.114	-0.615	-0.099	0.022	0.192	0.173	0.058	0.052	0.184
309	0.362	-0.075	-0.345	0.102	-0.041	0.127	-0.261	0.103	0.137	0.296	0.351	0.233
500	0.156	0.019	-0.617	-0.043	-0.101	0.557	-0.779	0.103	0.086	0.143	0.183	0.144
267	0.191	-0.243	-0.137	0.405	-0.182	-0.380	-0.036	0.208	0.107	0.235	0.145	0.239
266	-0.013	-0.342	-0.336	-0.127	-0.672	-0.221	0.043	0.085	0.088	0.038	0.078	0.092
019	-0.088	0.110	0.149	-0.437	0.044	0.477	0.109	-0.058	-0.036	-0.061	-0.026	-0.067
156	0.213	-0.257	-0.542	0.115	-0.413	0.224	-0.492	0.250	0.187	0.328	0.313	0.332
304	0.466	-0.005	0.111	-0.034	-0.059	-0.044	0.100	0.234	0.112	0.178	0.169	0.227
000	-0.239	-0.227	0.421	-0.012	0.050	-0.436	0.632	-0.029	-0.086	-0.112	-0.160	-0.098
239	1.000	-0.052	-0.212	0.319	-0.077	0.028	-0.201	0.278	0.215	0.304	0.295	0.346
227	-0.052	1.000	-0.266	-0.023	0.032	0.415	-0.010	0.021	0.005	-0.149	-0.179	-0.053
421	-0.212	-0.266	1.000	-0.027	0.465	-0.411	0.581	-0.185	-0.203	-0.149	-0.188	-0.233
012	0.319	-0.023	-0.027	1.000	0.333	-0.141	-0.236	0.109	0.075	0.248	0.184	0.187
050	-0.077	0.032	0.465	0.333	1.000	0.011	-0.071	-0.085	-0.144	0.021	-0.011	-0.090
436	0.028	0.415	-0.411	-0.141	0.011	1.000	-0.547	0.062	0.105	0.108	0.134	0.119
632	-0.201	-0.010	0.581	-0.236	-0.071	-0.547	1.000	-0.145	-0.163	-0.258	-0.310	-0.245
029	0.278	0.021	-0.185	0.109	-0.085	0.062	-0.145	1.000	0.517	0.434	0.272	0.846
086	0.215	0.005	-0.203	0.075	-0.144	0.105	-0.163	0.517	1.000	0.204	0.113	0.746
112	0.304	-0.149	-0.149	0.248	0.021	0.108	-0.258	0.434	0.204	1.000	0.691	0.711
160	0.295	-0.179	-0.188	0.184	-0.011	0.134	-0.310	0.272	0.113	0.691	1.000	0.467
098	0.346	-0.053	-0.233	0.187	-0.090	0.119	-0.245	0.846	0.746	0.711	0.467	1.000

Table 16. Simple Linear Correlations Between Education Belief Scores and Personality Traits of 164 Superintendents (Idaho and S. D. C. Group)

Factor	Description	r
A	Reserved, outgoing	.192 *
B	Less intelligent, more intelligent	.103
C	Affected by feelings, emotionally stable	.103
E	Humble, assertive	.208 **
F	Sober, happy-go-lucky	.085
G	Expedient, conscientious	-.058
H	Shy, venturesome	.250 **
I	Tough-minded, tender-minded	.234 **
L	Trusting, suspicious	-.029
M	Practical, imaginative	.278 **
N	Forthright, shrewd	.021
O	Placid, apprehensive	-.185 *
Q_1	Conservative, experimenting	.109
Q_2	Group-dependent, self-sufficient	-.085
Q_3	Casual, controlled	.062
Q_4	Relaxed, tense	-.145

H: $r = 0$
Degrees of freedom = 162
* Alpha = .05 R: $r \geq .154$
** Alpha = .01 R: $r \geq .202$

Table 17. Simple Linear Correlations Between Life Belief Innovation Scores and Personality Traits of 164 Superintendents (Idaho and S. D. C. Group)

Factor	Description	r
A	Reserved, outgoing	.173 *
B	Less intelligent, more intelligent	.137
C	Affected by feelings, emotionally stable	.086
E	Humble, assertive	.107
F	Sober, happy-go-lucky	.088
G	Expedient, conscientious	-.036
H	Shy, venturesome	.187 *
I	Tough-minded, tender-minded	.112
L	Trusting, suspicious	-.086
M	Practical, imaginative	.215 **
N	Forthright, shrewd	.005
O	Placid, apprehensive	-.203 **
Q_1	Conservative, experimenting	.075
Q2	Group-dependent, self-sufficient	-.144
Q3	Casual, controlled	.105
Q4	Relaxed, tense	-.163

H: r = 0
Degrees of freedom = 162
* Alpha = .05 R: r ≥ .154
** Alpha = .01 R: r ≥ .202

Table 18. Simple Linear Correlations Between Education Practice Scores and Personality Traits of 164 Superintendents (Idaho and S.D.C. Group)

Factor	Description	r
A	Reserved, outgoing	.058
B	Less intelligent, more intelligent	.296 *
C	Affected by feelings, emotionally stable	.143
E	Humble, assertive	.235 *
F	Sober, happy-go-lucky	.038
G	Expedient, conscientious	-.061
H	Shy, venturesome	.328 *
I	Tough-minded, tender-minded	.175
L	Trusting, suspicious	-.112
M	Practical, imaginative	.304 *
N	Forthright, shrewd	-.149
O	Placid, apprehensive	-.149
Q_1	Conservative, experimenting	.248 *
Q_2	Group-dependent, self-sufficient	.021
Q_3	Casual, controlled	.108
Q_4	Relaxed, tense	-.258 *

H: No relationship exists
Alpha = .05
Region of rejection r = .20
df = 92

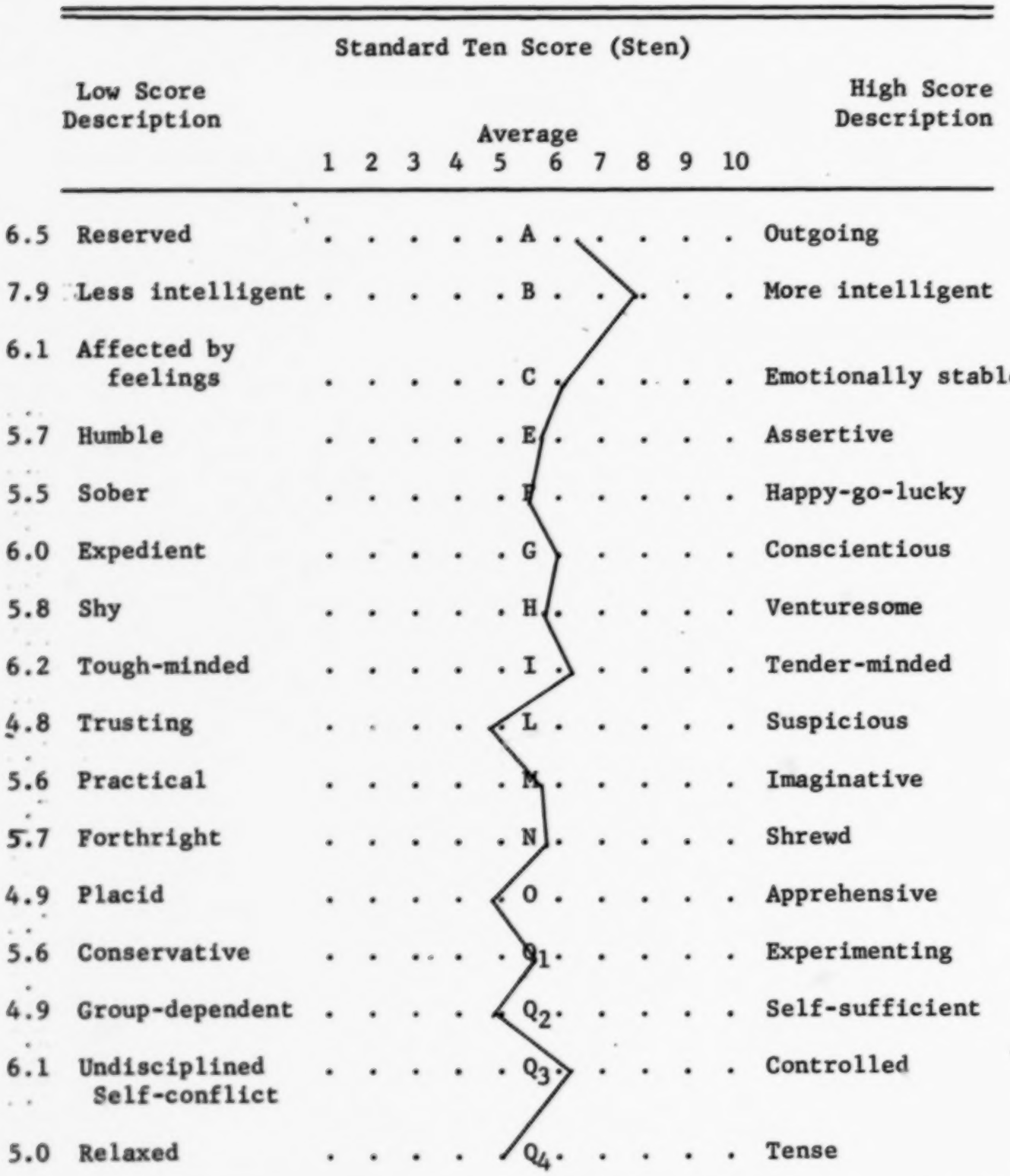
* Significant at the .05 level

Table 19. Simple Linear Correlations Between Composite Innovation Score and Personality Traits of 164 Superintendents (Idaho and S. D. C. Group)

Factor	Description	r
A	Reserved, outgoing	.184 *
B	Less intelligent, more intelligent	.233 **
C	Affected by feelings, emotionally stable	.144
E	Humble, assertive	.239 **
F	Sober, happy-go-lucky	.092
G	Expedient, conscientious	-.067
H	Shy, venturesome	.332 **
I	Tough-minded, tender-minded	.227 **
L	Trusting, suspicious	.098
M	Practical, imaginative	.346 **
N	Forthright, shrewd	-.053
O	Placid, apprehensive	-.233 **
Q_1	Conservative, experimenting	.187 *
Q_2	Group-dependent, self-sufficient	-.090
Q_3	Casual, controlled	.119
Q_4	Relaxed, tense	-.245 **

H: r = 0
Degrees of freedom = 162
* Alpha = .05 R: r > .154
** Alpha = .01 R: r > .202

Figure 5. The 16 P. F. Questionnaire Mean Personality Profile of the National (S.D.C.) and Idaho Superintendents


Standard Ten Score (Sten)
Low Score Description
High Score Description
Average
1 2 3 4 5 6 7 8 9 10
6.5 Reserved . . . . . A . . . . . Outgoing
7.9 Less intelligent . . . . . B . . . . . More intelligent
6.1 Affected by feelings . . . . . C . . . . . Emotionally stable
5.7 Humble . . . . . E . . . . . Assertive
5.5 Sober . . . . . F . . . . . Happy-go-lucky
6.0 Expedient . . . . . G . . . . . Conscientious
5.8 Shy . . . . . H . . . . . Venturesome
6.2 Tough-minded . . . . . I . . . . . Tender-minded
4.8 Trusting . . . . . L . . . . . Suspicious
5.6 Practical . . . . . M . . . . . Imaginative
5.7 Forthright . . . . . N . . . . . Shrewd
4.9 Placid . . . . . O . . . . . Apprehensive
5.6 Conservative . . . . . Q1 . . . . . Experimenting
4.9 Group-dependent . . . . . Q2 . . . . . Self-sufficient
6.1 Undisciplined Self-conflict . . . . . Q3 . . . . . Controlled
5.0 Relaxed . . . . . Q4 . . . . . Tense

S.D.C. and Idaho Combined Sten Profile

Profile prepared from sten scores adjusted to the age of the superintendent.